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OKLAHOMA STATE MEDICAL ASSOCIATION

VOLUME XXIV MUSKOGEE, OKLAHOMA, JULY, 1931. NUMBER 7

THE NORMAL AND THE DISEASED HEART

J. H. MUSSER, M.D.
NEW ORLEANS

(From the Department of Medicine, Tulane University School of Medicine.)

I have selected for the subject of my oration this day, the heart. This may seem like a trite and threadbare subject to bring before this splendid organization, but I have done so because I believe all practitioners of medicine, be they engaged in special or general medical work, feel that they are well acquainted with this organ, that they are capable always of making a diagnosis of heart disease and in most instances that they can manage successfully cardiac disorders. This is undoubtedly true, but, because of the ever increasing and ever piling up mass of information on any and every subject of medicine, the average man, no matter how industrious, cannot keep pace with this mountainous conglomeration of material, coming from the pen of so many authors. Therefore, it is thought to be of interest to present some of the newer concepts of the heart in health and in disease rather than to undertake to deliver a lecture on economics, or a discussion of the social problems of medicine, or a philosophic address or even a political oration.

THE ANATOMY OF THE HEART

This always functioning muscular organ, never ceasing to work as long as life exists, situated in the middle mediastinum, lies obliquely in the thorax with the base at the level of the fifth to eighth thoracic vertebrae and the apex in the midclavicular line, opposite the space between the fifth and sixth costal cartilage. Practically the entire anterior surface of the heart is made up of the right ventricle with only a thin edge of the left ventricle presenting itself at the extreme outermost left margin of the heart. The details of the blood supply and the arrangement of the valves and nerves that control cardiac action are familiar to you all. The pathways of cardiac impulses may not, however, be quite so well known, so I will undertake a very brief discussion of the conduction system. The pacemaker of the heart, in which the impulses arise, is the sinus node, a specialized collection of tissue of club shape, which lies in the junction of the superior vena cava and the right auricle. The impulse arises at this particular spot, is transferred fanwise, according to Lewis, through the auricle by tissue as yet unidentified to the auriculoventricular node which was first demonstrated by Tawara in 1906. From this particular node the impulse is carried through the bundle of His, a neuromuscular structure, which contains muscle tissue with nerve fibers embedded and enmeshed in the muscular tissue, splitting at and straddling the membranous portion of the interventricular septum. The bundle divides near the aortic valve into two main branches spoken of as the right and left branches. The left branch passes through the interventricular septum and divides into many branches, subdividing and resubdividing until we have the minute and intricate Purkinje fibers, which are present in enormous numbers throughout the ventricular wall. The right branch runs as a single strand to the anterior papillary muscle and then also divides and subdivides, undergoing arborization. It, too, divides into the Purkinje fibers.

PHYSIOLOGY OF THE HEART

In considering the mechanism of the normal heart beat it is advisable to understand that the contraction wave starts in the sino-auricular node either because of faster rate of anabolism or because the specialized tissue of the node may be affected by minute alterations in th pH of the blood. "This anabolic process has potential energy, and when it is touched off by nervous impulses, kinetic energy is released, the level of discharge being reached simultaneously by all cells." (Herrmann).

The heart muscle has five fundamental functions, some of which are inherent in any muscle tissue, others of which are either peculiar to heart muscle or work differently than in ordinary muscle. These five functions are *excitability, tonicity, stimulus production, conductivity,* and *contractility,* not given in the order of their importance but given in this form so that it may be possible to dismiss the first

two with the statement that these particular functions are in no ways different from that of voluntary muscle. *Stimulus proluction*, however, is something which is inherent in cardiac muscle alone and seems to be present in any portion of this type of muscle tissue. It depends, of course, upon the presence in heart muscle of nerve elements, In conjunction with this particular function there has arisen much discussion as to whether impulses could arise in a muscle without the nervous tissue. Recent studies have shown, however, that nervous tissue is present in the specialized tissue of the heart and therefore that the myogenetic theory cannot be said to exist; whereas, the neurogenetic theory is substantiated. In the intact normal heart the vagus inhibits, the sympathetics increase stimulus formation. The next important function of heart muscle, that of conductivity, depends upon the presence of specialized neuromuscular tissue in the myocardium, such as is mentioned in the bundle of His when discussing the anatomy of the heart. Contractility, with its subsequent period of contraction, is followed by the refractory stage during which time, for a brief period at least, it is impossible to stimulate the heart to contract. Gradually again in time periods of fractions of a second the ability to contract returns, but the shorter is the period of rest, the more diminished is the output of the heart. In other words, the degree of contraction varies in relation to the length of the previous diastole. This important physiological fact is of great value to the clinician because the slower is the heart, the greater is the opportunity for rest and the more powerful is the systolic output; whereas, the more rapid the heart action, the greater is the chance of cardiac failure. Therefore, slowing of the heart is of primary importance in the treatment of cardiac disease. The all or none law bears a direct relation to the function of contractility. This law implies that the heart contracts to the height of its ability at the time, depending upon the stage of diastole.

THE EFFECTS OF DISEASE UPON THE HEART

Disease affects the heart in one of several ways. It requires greater work on the part of the organ with consequent development of fatigue, and to obviate the effect of fatigue the heart muscle hypertrophies, eventually hypertrophying to such an extent that it can no longer do so and then dilatation ensues. Disease also directly injures the musculature of the organ, produces pathologic changes in the organ, and lastly it may occasion alteration of the blood supply, which in turn will cause to eventuate disease processes.

CRITERIA FOR THE DIAGNOSIS OF HEART DISEASE

In an individual who complains of certain symptoms or who shows certain physical findings, how much stress should one lay upon these observations and how much should they be discounted? It is difficult to answer these questions. Subjective symptoms are always likely to bring about certain variations according to the reaction of the patient to various stimuli, and the symptoms of which the patient complains are not as reliable as are the objective findings; but, on the other hand, it is only through proper interpretation of subjective symptoms that often the physician may arrive at a clear understanding of the functional ability of the heart muscle. There are certain subjective symptoms which are of extreme importance in the diagnosis of heart disease. There are combined subjective and objective symptoms which likewise are extremely valuable in arriving at a diagnosis, but these symptoms may occur in conditions other than heart disease; whereas, the ten important objective signs, when one or more are present, are definitely pathognomonic of heart disease (Herrmann).

The first important subjective symptom is *heart pain*. This pain may be due to simple fatigue of the heart muscle such as happens in patients with chronic hypertensive disease or disturbed rhythm; it may be of the type of paroxysmal heart pain usually spoken of as angina pectoris; it may be the acute overwhelming agony of coronary thrombosis: it may arise from aortic disease or it may be secondary to several other factors of much less importance. Palpitation of the heart is a symptom which the patients know a great deal about and about which the physician knows much less. Palpitation of the heart may occur in a variety of conditions. When due to heart dysfunction, as it is in many cases, it is the result of irregularity of the heart action. *Dyspnea* implies an insufficiency of the left ventricle. It arises as result of decrease in the rate of flow of the blood with a consequent increase in the rate of respiration in order to oxygenate the blood more rapidly when it is arriving in the lung in smaller quantities than normal. Meakins has shown that the minute output of the heart which is diseased is 3.5 liters; whereas, in the normal heart it is from 5.5 to 7 liters. Shortness of breath may also be due to decreased pulmonary

ventilation as result of presence of exudate in lung alveoli or lung capillaries and because of the mechanical cutting down of the aeration surface of the lung by the presence of a much enlarged heart or by a considerable collection of pleural fluid which compresses the lung tissue and throws it out of commission. The vital capacity, as a consequence of these several factors, is reduced in heart disease; and while the average individual may not have the normal capacity of 2.5 liters per square meter of body surface, a cardiac patient has a markedly reduced vital capacity, which will improve as he improves or still further diminish as his condition gets worse. Dyspnea may also be caused by other factors much less important than decrease in flow of fluid, such as decreased metabolic rate or defective interchange of gases. *Fatigue* is another extremely important symptom of beginning cardiac insufficiency. Often it appears before other subjective symptoms as dyspnea, pain or palpitation. Frequently it is the symptom which brings the patient first to the physician.

Combined subjective and objective symptoms are so classified because a patient may observe them or may not, but the doctor always looks for them. *Cyanosis* is the result of oxygen unsaturation and depends upon the reduction in the rate of blood flow as a result of the failure of the left ventricle or on secondary pulmonary changes or because of congestion of the systemic veins as a result of the inability of the right heart promptly and efficiently to empty itself. *Edema* depends upon obstructed blood flow. Because the venous and capillary pressure is greatest in dependent parts, it follows that edema develops first in the lower limbs. When the patients are in the upright position or if they are confined to bed in a sitting posture, it will be felt and seen best over the extreme end of the spine.

The pathognomonic objective signs of heart disease may be present in a few other conditions, but as a rule only one of them; whereas, in heart disease always invariably two or more will be noted. These definite and positive objective findings are as follows:

1. Engorgement of the neck veins.
2. Displacement of the cardiac impulse.
3. Abnormal pulsations.
4. Thrills and shocks.
5. Excessive or high pulse rate.
6. Irregular pulse.
7. Sclerosis of peripheral vessels.
8. Enlargement of the area of aortic and cardiac dullness.
9. Diastolic murmurs.
10. Persistent hypertension.
11. Laboratory evidences of chronic nephritis.

The easiest of these to demonstrate are the irregularities or alterations in the rate of the pulse, thrills, and diastolic murmurs. These three are less prone to be affected by the individual skill of the examiner; practically none of the eleven pathognomonic signs are affected by the apprehension and fear of the patient.

PHYSIOLOGIC DISTURBANCES

Under this heading it is proper to discuss cardiac irregularities. No effort will be made to bring out more than the very salient features of the action of a heart which is not regular.

Sinus arrhythmia is a well-known type of irregularity occurring in young people in which there is usually an inspiratory quickening and expiratory slowing of the heart rate; although the respiratory relation may be reversed.

Premature contractions, extrasystoles or ectopics, are new and isolated impulses arising anywhere in the special tissue and occurring usually irregularly. They are found with a fair degree of frequency in such conditions as hypertensive heart disease or rheumatic heart disease, but also they may develop because of excessive imbibition of coffee and tea or the use of tobacco; while the plebian complaint of gas in the stomach is responsible for a certain number of ectopics in the heart unaffected by structural disease. A patient often recognizes these extra beats and sometimes the subjective recognition is extremely disturbing to the peace of mind of a high-strung, nervous individual. The physician recognizes the condition as dropped beats which may occur occasionally or if with a degree of regularity producing the pulsus bigeminus or trigeminus. Quinidine is often of considerable value in doses of 5 grains three times daily in controlling these abnormal beats.

Paroxysmal tachycardia is readily diagnosed. The sudden starting and equally abrupt stopping of a markedly increased heart rate is so characteristic that it is diagnosed usually by the patients' story of how their heart behaves. While it is true that this type of irregularity occurs

more frequently in rheumatic heart disease with mitral stenosis than in any other cardiac condition, nevertheless it may be produced in an apparently normal heart by such factors as are responsible for extrasystoles. In about fifty per cent of patients the attack may be brought to an end by vagus pressure, pressing first on the right vagus with the ball of the thumb at the level of the cricoid cartilage, pressing for about fifteen seconds and then pressing over the left vagus, if the rapid heart action does not cease. Repeat this four or five times before coming to the conclusion that vagus pressure is not going to bring to a stop the paroxysm of tachycardia at that time. Sometimes deep breathing or gulping of ice water will carry to a conclusion an attack of rapid heart action. In the interval between attacks small doses of digitalis should be given a trial.

Heart block may be either partial or complete; in the latter case the ventricular beats are from twenty-eight to forty-four per minute, the ventricle beating at its own inherent rate. Partial block may be merely an increase in A-V conduction time. Heart block in a great majority of cases occurs in conjunction with rheumatic heart disease, but, although rheumatic fever is responsible for an appreciable number of cases, syphilis is frequently incriminated. White states that ten per cent of cases are produced by digitalis, while Vaquez, the French cardiologist, says that fifty per cent more closely approximates the true figure. Aside from the slow pulse, a reduplication of the first mitral sound, later of the second mitral, may be observed. Sometimes the patients have the Stokes-Adams syndrome of ventricular standstill with convulsive seizures, which may terminate in death. If these patients are having repeated attacks or have complete or even partial block, barium chloride, persisted in, very often brings about amelioration of symptoms.

An alternating pulse is recognized with a fair degree of accuracy in taking blood pressure. It will be noted that every other beat will be responsible for an increase in pressure of five to ten millimeters of mercury. An alternating pulse is of serious prognostic significance, but is not as bad a sign as we thought it was a few years ago.

Auricular flutter is one of the few types of irregularities which cannot be recognized by the physician on physical examination in the great majority of cases. The most important criterion is probably the presence of an irregular heart which may sometimes be made regular by exercise. Fortunately, it is a rare condition. It is a definite indication for administration of digitalis.

Auricular fibrillation, occasioning the absolutely irregular heart, is extremely common and is due to the so-called circus movement first described by Nimes and Garrey and definitely established by Lewis. In this condition auricular impulses are shot at the bundle of His at the rate of four hundred fifty to six hundred per minute. The ventricle responds by beating at a rate of sixty to one hundred eighty, depending upon the number of impulses passing through the bundle of His which do not occur during the refractory stage, but always with a complete and total irregularity. In the young individual this particular disturbance of rhythm is due to rheumatic heart disease with mitral stenosis or very much more rarely to the thyroid heart. In the old individual in whom the condition may exist for years and is not incompatible with a relatively good function of the heart, arteriosclerosis produces the condition. When the fibrillation is rapid, there are usually signs of cardiac failure; but in the older arteriosclerotic patient the rate is slow and does not produce symptoms of heart failure. Rapid auricular fibrillation is a definite indication for digitalis and in a few patients the use of quinidine.

Ventricular fibrillation is probably quite infrequently recognized. It may be the cause of sudden death during the course of auricular fibrillation or when too much digitalis is given or when a patient dies during chloroform anesthesia.

HEART FAILURE

Heart failure may be of the (a) congestive type or (b) anginal type. The first depends almost invariably upon failure of the heart muscle. In this condition the veins of the neck are engorged because of increased back pressure from right heart dilatation and insufficient emptying. The patient is dyspneic and cyanotic; basal rales are heard and edema of the extremities is present; the liver is swollen and tender and urinary excretion is cut down.

In the anginal type of failure there are paroxysms of, or more or less steady, heart pain. This type of failure is very much more prone to occur in males who have passed the age of forty, and it is seen with peculiar frequency among professional classes and notably the practitioners of medicine. Attacks of heart pain are

usually induced by exertion, emotions, or eating, the three "e's." Just what causes these paroxysms of pain is not known. It may be due to spasm of the coronary arteries; it may be that the coronary vessels admit only sufficient blood for ordinary purposes as a result of arteriosclerotic processes; and although MacKenzie holds to the aortic theory, he does speak of the uncertainty of knowledge concerning the cause and says that the condition should always be considered a form of heart failure. In this disturbance the blood pressure may be high or low, usually the former. The treatment of the attack consists of nitrogolycerin dissolved under the tongue or morphine hypodermically. Euphyllin increases the rate of coronary flow, therefore is valuable in controlling the pain and lessening the frequency of attacks. Several years ago a great deal of discussion arose as to the value of cervical sympathectomy, by which procedure it is possible to sever the sympathetic pathways to the heart. This form of treatment apparently has not entirely stood the test of time.

THE CLASSIFICATION OF HEART DISEASE

The advantages of a complete and full diagnosis are nowhere better exemplified in medicine than in heart disease. A full diagnosis should contain the following information: the factor responsible for the production of the disorder; the anatomic (pathologic) changes manifest; the physiologic disturbance present; and the functional ability of the organ at the time of examination. With these data it is possible to convey to the mind of the individual to whom they are presented a complete picture of the type of heart disease, how it manifests itself, what is to be the ultimate outcome of the case, as well as the possibilities of economic independence.

Etiologic Diagnosis. The classification of heart disease of the American Heart Association lists a considerable number of conditions which are responsible for heart damage. A trio of etiologic causes, rheumatic fever, arteriosclerosis and syphilis, is the responsible agent for the great majority of patients who develop signs and symptoms indicating heart disturbance. These three conditions are the cause of 75 per cent of all heart disease. Very much less important factors are bacterial infections, the thyroid or goiter heart, toxic conditions, and congenital lesions. A not inconspicuous group of conditions remain, which may be the cause of heart disease. They are extremely rare and from their very rarity need not be discussed at the present time.

The anatomic alterations and pathologic changes that take place in the heart from the clinical standpoint include hypertrophy and dilatation of the heart muscle, which muscle, postmortem, may show the presence of fibrosis, fatty infiltration or degeneration, infarction or Aschoff bodies. The physical signs of a diseased endocardium paints for the physician the picture which he is wont to speak of as valvular heart disease. At autopsy may be seen scarring, retraction, overgrowth, or vegetations on the valves. Pericardial lesions are difficult to diagnose at the bedside. In the great majority of cases there are not outstanding physical features indicative of the pathologic lesion, which may be an acute fibrous exudate, an effusion or the formation of adhesions between the two layers of the pericardium. The condition of the coronary vessels is invariably determined by the pathologist. The lesions of these vessels include thrombosis, sclerosis, or the presence of embolic obstruction. Congenital defects should be classified both by the clinician and the pathologist as well as the state of the great vessels, notably whether there is dilatation of the aorta, which may be general as part of the phenomenon of senescence, or saccular as result of syphilis.

The physiologic abnormalities include the several types of irregularities already mentioned.

Functional Diagnosis. The estimation of the functional ability of the heart depends in goodly part upon the subjective reactions of the patient to physical effort and to a larger extent to the demonstration of alterations in the existing pathology after a work test has been used. It is customary then to estimate, when there is organic heart disease, as evidence of functional ability of the organ, the ability of the patient to do ordinary work, or, if the cardiac dysfunction is great, to note that in the presence of such heart disease the patient is unable to do ordinary work. The most severe type of marked malfunction of the organ is seen when there is heart failure at rest. This failure may be of the congestive or anginal type as already indicated.

THE IMPORTANT ETIOLOGIC TRIO

It is my purpose now to say a few words in regard to the three types of heart disease which are responsible for three-

fourths of the cases diagnosed as heart disease.

Arteriosclerotic Heart Disease. General disturbances of circulation or local alterations in the supply of blood to the heart occasion the greatest number of heart patients. The senescent heart is the senile heart in which involution processes have taken place. The condition, caused as it is by alterations in the supply of the blood fundamentally is dependent upon those factors which cause arteriosclerosis and include infection, excessive mental strain, familial tendency and the action of toxic substances. Just how little is known of the etiologic factors responsible for arteriosclerosis is exemplified by the fact that in practically all textbooks lead poisoning is given as one of the causes of a disease which is extremely prevalent and yet this particular cause, usually stressed, is an extremely rare condition.

The patient with a senescent heart complains of symptoms which depend very largely upon general failure of the circulation. They have headaches at times; dizziness on slight exertion is annoying, and their friends notice loss of memory. At times pain in the legs after exercise or transient attacks of aphasia, or even more pronounced cerebral disturbances, are found to depend upon intermittent claudication, which involves the vessel through which an increased amount of blood has to be carried, and which responds to this over-demand by going into spasm, cutting off temporarily the supply of blood to the part.

On examination of such patients, the condition of the peripheral arteries often gives a lead which, followed to its termination, results in the diagnosis. It should not be forgotten, however, that sclerosis of one vessel does not necessarily indicate sclerosis of all vessels and therefore all of the accessible superficial vessels should be palpated. Furthermore, it is important to recall that just as there are variations in the external arteries, so the internal vessels may vary. A man with cerebral arteriosclerosis may have no evidence of coronary arteritis; whereas, he who dies as result of coronary thrombosis may have no distinguishable pathologic alteration of the cerebral vessels.

It is in this type of patient that angina pectoris often develops when they have passed the age of fifty-five. In many cases it is due to the sclerotic changes in the coronaries. It is quite compatible with a low blood pressure.

In the treatment of the patient with the senescent heart much can be done to prolong life and to relieve the symptoms. This is the one type of heart disease in which mild exercise is advisable; but in which the mental activities should be diminished. There is very much less disturbance in the dynamics of the circulation if the patients are not kept in bed for prolonged periods of time. Their headaches, dizziness, and cerebral symptoms in general will be improved with seven hours as a limit, or even six hours, of time which they lie in a prone position. To make up for the sleep they have lost and yet need, it is infinitely better that they take a mid-day nap of several hours or even a nap after the evening meal if the sleep during day time is insufficient, than to have them flat on the back continuously for eight to twelve hours.

Hypertensive Heart Disease. A great deal of interest has evinced itself in this particular form of heart disease since the introduction of the sphygmomanometer. Much interest has arisen also because of the frequency which hypertension is responsible for the breaking down of an individual in the prime of his life. It is the man between the ages of forty and sixty who develops this type of disease and often it is the man who is most valuable to the community. Sir William Osler has said that Venus, Mars and Vulcan are responsible for most of the cases of hypertensive heart disease, but certainly Epicurus and Bacchus also play an important part in producing this syndrome. A host of causes has been called into conference to explain why this condition develops. One of the most definite facts that we have to work upon is the undoubted familial tendency exhibited by members of the white race to develop this disease. I know of any number of families, male members of which have lead a hygienic, sane, God fearing life, who died before the age of fifty of some one or another manifestation of excessive blood pressure.

The symptons of this condition in the early stages are of no importance to the individual. As a matter of fact, the man with high blood pressure is the big, strong, florid, healthy, pushing, hustling type who always feels at the height of physical efficiency. Then gradually comes the evidence of breakdown. Sad indeed it is to see these patients go to pieces. They have always represented the epitome of everything healthful. When they die, they die as result of various causes. The late

Theodore Janeway, who had an unequaled opportunity of following from incipiency to lethal end a considerable series of patients with hypertension, found that 32.6 per cent of them died of gradual heart failure, 25 per cent of uremia, 15 per cent of apoplexy, 5.6 per cent of angina pectoris, and the remainder of a variety of causes. The early symptoms being absent and the later symptoms of the conditions, just mentioned, coming on often most abruptly would indicate that the average patient is not recognized as having potential hypertensive heart disease until too late. It is for this individual that routine health examinations are decidedly beneficial because certainly much can be done to delay the full-blown disorder by appropriate measures such as reduction of food and salt intake, rest, sufficient mental relaxation, and a removal of disquieting stimuli. A most practical therapeutic measure for these patients, who have to be up and about six days in the week in order to support those who are dependent upon them, is to have them spend the seventh day in bed, absolutely and totally relaxed with a complete cessation and removal from their minds of all matters that come up during the week day. Possibly this may be brought about as a result of the physician's suggestion to avoid thought about such matters or because of the doctor's insistence on taking up some other definitely organized train of thought on that day—the reading of detective stories, the survey of recent biographies, or some such restful reading avocation.

Rheumatic Heart Disease (Chorea). The sad feature of rheumatic heart disease lies in the fact that the patient is crippled in young adult life. The man with senescent heart has lived his life and has had his fill of what life brings. The poor young person with this type of disease of the heart at best can look forward only to a life of partial invalidism, which, as Cohn has shown, in the average patient will last for a period of fifteen years from the time of the first attack of rheumatic fever. Chorea, possibly caused by the same virus, but even if such is not the case, bears a very close relation to rheumatic fever and occurs much more frequently in females than in males, approximately two of the former to one of the latter being affected; whereas, in rheumatic fever the ratio is reversed. The two conditions may occur in combination. Chorea damages the heart very much more frequently than does rheumatic fever, but the damage is much more extensive in rheumatic fever than in chorea. In rheumatic fever the higher the fever and the more pronounced the obvious manifestations, the more severe and the more grave are the cardiac complications.

While a history of out-and-out rheumatic fever as a distinct entity is sometimes hard to elicit from a patient, irregular and atypical forms occur which are undoubtedly due to the same causative organism. These include irregular fever, repeated sore throats, indefinite growing pains, and vague arthritic symptoms; all of which are probably part and parcel of the rheumatic syndrome, which leaves in its wake cardiac involvement. Just how frequently this is a complication of the frank cases of rheumatic fever has been shown by Cohn and Swift, who demonstrated in thirty-five of thirty-seven patients with rheumatic fever electrocardiographic deviations from normal.

The patient with rheumatic heart disease in the majority of cases ultimately develops mitral stenosis and this narrowing of the mitral valve is the end result of the inflammatory changes that were induced by the organisms causing rheumatic fever. These patients complain of usual symptoms of heart failure, but there are three other rather interesting manifestations of the disease that might be mentioned: precordial pain from compression of the left coronary, hoarseness or aphonia from paralysis from the left recurrent laryngeal nerve and often hemoptysis from the damming back of the pulmonary circulation as a result of the obstruction at the mitral valve to the onward flow of the blood stream.

The physical examination of these patients is quite characteristic. They exhibit the mitral facies and the malar flush, tinged with a slight cyanosis; the lips are usually somewhat red. A palpatory examination of the heart yields some such definite information as systolic shock, diastolic thrill, and, in the late stages of the disease a completely irregular action of the organ; while auscultation gives a diastolic murmur, which may be crescendo or diminuendo, and with a ringing, snapping first sound that even in the absence of a murmur and a thrill are so characteristic as almost to make the diagnosis. The accentuated pulmonic second sound and the occasional finding of Graham Steele murmur, an early high-pitched diastolic regurgitant blow over the pulmonic area, are confirmatory evidence.

In the treatment of patients with rheumatic heart disease there are several basic and fundamental therapeutic measures to be observed. If the patient is seen during an attack of rheumatic fever, give a half grain of sodium salicylate combined with an equal amount of sodium bicarbonate per pound of body weight. Keep the patient in bed in case of a mild attack for three weeks after cessation of fever and in more severe cases not less than three months. Take out the tonsils. Information as to the importance of these structures in producing the common relapse, while debatable, is sufficiently conclusive, I believe, to indicate operation. After the patient has gotten well of the rheumatic fever, regulate the life and when auricular fibrillation develops, as it will do sooner or later, put the patient on digitalis and keep him there.

The question of marriage comes up more frequently in this type of heart disease than in any other because of the fact that it is the young patient who has the condition. Advise the male that if he takes up the burden and responsibility of a family, his life expectancy will probably be shortened on account of the additional burden of supporting others besides himself. To the woman the great question is whether or not she can go through the throes of labor. To the inquiring female candidate for matrimony I will say that with the proper medical supervision there is very little danger, comparatively speaking, of a cardiac breakdown as result of parturition. Therefore, unless there is distinct contraindication in physical examination, such as advanced heart failure, there is no reason why the patient should not have one or two babies.

Syphilitic Heart Disease. Cardiovascular involvement is found in from 70 to 80 per cent of chronic syphilitics. It is of some interest to note that the patients who show the parenchymatous types of syphilitic cerebral disorders do not show with the same degree of frequency vascular changes, indicative, of course, of the existence of several strains of spirochetes, the most important strain numerically spending its energy in attacking the blood vessels, while the very much less frequent type invades the brain tissue.

In this type of heart disease it was at first believed that the aorta and aortic valves were alone involved. Warthin has shown very definitely that there is present an interstitial myocarditis. In many cases the myocarditis is as responsible for the symptoms as is the aortic valvular lesion.

The heart symptoms of cardiovascular syphilis, as with the arteriosclerotic heart, develop insidiously, gradually and slowly, and the patient, who has probably reached his fortieth year of life, will begin to complain of anginal pain, paroxysmal dyspnea, and of cerebral circulatory disturbances. When this patient is examined, all the characteristic physical findings may be observed: throbbing arteries, capillary pulse, markedly enlarged heart, a soft, evanescent, and vague diastolic basal murmur, heard usually best at the left of the sternum at the second and third interspace. It is interesting to note that these patients seldom develop cardiac arrhythmia, and of the severe arrhythmias, heart block is the only one of moment.

I want to stress the importance of assiduous, diligent, and careful treatment of the patient who presents himself with these well marked signs of aortic insuffiency. The indication, of course, is to inhibit the progress of the infection, but active syphilitic therapy has been responsible, usually when arsphenamine has been used and possibly because of the toxic effects of arsenic on the heart, for the breakdown of a large number of patients who would probably have kept on for some years before ultimately they would have died. If you use arsphenamine, start with small doses, 0.15 grams, and increase to a quantity no greater than 0.45 grams, giving six to ten injections. If mercury is used, give 2 grains weekly, intramuscularly, for twelve weeks. Probably the most satisfactory drug is bismuth which is given, as a course of treatment, to total 45 grains, 1½ to 2 grains being administered hypodermically twice a week until the completion of the period of treatment. I would give these drugs, stopping for a period of a month and then repeating the course of treatment, continuing to do so until the Wassermann has remained negative on repeated examination. Potassium iodid, it seems needless to state, is to be more or less continuously given over a long period of time.

In spite of all that is done the majority of patients with syphilis rapidly go down hill and response to treatment is unsatisfactory and disappointing.

DIGITALIS

No lecture on the heart can be said to be complete unless there is some word as to therapy, and the therapy of heart disease

boils itself down in most cases to the use of digitalis. I will run over briefly the pharmacology of this preparation and the therapeutics. Digitalis lessens the heart rate by stimulation of the vagus to which is added the factor of its effect on the junctional tissues. It increases the contractility of the heart and depresses the peripheral blood vessles. In order to get the full effects of digitalis its administration has to be pushed so that toxic effects are not out of order.

These toxic manifestations include gastric pain, nausea, and vomiting, due to the action of drug on the vomiting center of the brain, diarrhea from time to time, disturbance of vision, coupling of the pulse in 70 per cent of the cases, and development of various other irregularities at infrequent intervals. Digitalis is given when there is congestive heart failure, with a rapid or a slow pulse. In heart failure with slow pulse it improves the contraction of the heart and in rapid acting heart it slows the rate. Digitalis is of no benefit in such conditions as shock and the poisoning of severe infectious diseases, and it is distinctly contraindicated in diphtheria and heart block. Administration of digitalis is on a sane and rational basis. In order to secure digitalization the therapeutic dose is estimated by the following formula: 1 cc. of the tincture to ten pounds of body weight, or 0.1 gram of the powder. If the patient has not had digitalis previously and case is urgent, give a half of the estimated dose, then a fourth, then an eighth and continue with one-eighth dosage. If rapid digitalization in a non-urgent case is required, give one-third, one-third, and one-tenth of the indicated amount. Never give the drug more frequently than every six hours, otherwise toxic effects will not have time to develop before the patient has taken too much of the preparation. If the patient has taken digitalis within the past ten days give one-fourth the estimated dosage at three periods and then a tenth. After the patient has become digitalized with the estimated dose, the maintenance dose for the average individual is 1.5 cc. of the tincture or 0.15 grams of powder. Children require fifty per cent more per pound body weight than do adults. Stop digitalis if the patient is nauseated or shows other toxic effects. Never let the pulse get under 60. If therapeutic effects have been obtained, cease medication. There is no earthly use of giving digitalis intravenously or intramuscularly. Large dosage by mouth seems to be more efficacious than when given hypodermically. If patient is vomiting as result of gastric congestion from congestive heart failure, give the patient the drug by rectum in doses equivalent to those given by mouth.

In the treatment of heart disease other drugs are occasionally useful—adrenalin in cardiac standstill or Stokes-Adams syndrome, or in angina pectoris; barium chloride, particularly valuable in heart block; ammonia and strychnine the occasional stimulating action of which is entirely reflex through nervous influences; quinidine in cases of auricular fibrillation of short duration which digitalis does not stop; and euphyllin, which increases coronary flow when there is angina pectoris or heart pain.

TUESDAY, MAY, A. M.

QUESTIONS ASKED DR. MUSSER AFTER READING OF HIS PAPER ON THE NORMAL AND DISEASED HEART

Question. What particular form of therapy should be employed and what would be the physical limitations in angina pectoris?

Answer. I think that as far as physical limitations go, that we must test out the individual patient. I think the average man should control the amount of exercise and physical effort that he carries out so that he has no heart pain. Walking or working up to some slight strain, is the best way to accurately limit the patient's activities. It may be necessary to put the patient to bed for a period of some weeks or even months. He may need absolute rest. As far as therapy is concerned, we depend largely on nitro-glycerin, and it must be used more or less symptomatically according to the frequency of the pains. Sodium nitrite may be used also.

Question. How may we stop paroxysmal tachycardia?

Answer. Paroxysmal tachycardia can be stopped some times by pressing the ball of the thumb on the vagus for about 15 minutes. If it does not work on the right try the left, and continue until the attack stops. Sometimes pressure on the eye ball may be efficacious. The only other thing that we can do, is to put the patient to bed and give digitalis. There is no doubt in my mind, but that this condition will eventually cause a disturbance of the heart. There is no specific that I know of which will abort the attack. The attack

has to stop just about as abruptly as it came.

Question. What is the status of strophanthus?

Answer. It is not really advisable to use, because with the various digitalis preparations, notably the tincture and the powder, we have a drug standardized with a great degree of accuracy. Of course however, this drug is an excellent drug. Strophanthine is the best preparation for the administration of cardiac stimulant when we have to give a cardiac drug intravenously. In acute heart failure, strophanthine works very much better than any other digitalis preparation that we have. We do get magnificent results.

Morphine is the drug par excellence in many heart conditions. In acute, congestive failures, give the patient rest, physical rest and indirectly heart rest. I am a great believer in morphine. In coronary occlusion, morphine is reliable.

I give euphyllin in angina pectoris or heart pain as it has a tendency to increase the coronary flow.

In the syphilitic heart, we use bismuth almost entirely. Stokes of Pennsylvania University uses bismuth almost entirely. Bismuth is given as a course of treatment, to total 45 grains—1½ grains to 2 grains hypodermically two times a week until the end of the period of treatment. I would then stop for a month and then repeat the course of treatment until the Wassermann has remained negative on numerous examinations.

In heart failure give rest, cut down all exercise. Strychnine has no effect as a direct heart stimulant. It does however make the patient feel very much better.

When we have heart failure, we are going to develop signs of muscle failure, so the integrity of the heart muscle is the important and fundamental feature of any study of a heart patient.

We do not know very much about the cause of essential hypertension. The important fact in this condition is that we have essentially a disease of the small blood vessels. We may not be able to actually demonstrate the changes in the blood vessels.

Let us give our patients as much rest as possible. Bleeding and prolonged sweating will often do more harm than good. I do not think in extremely high blood pressure cases, that we can get very far with treatment. In essential hypertension, the patient does better by change of enviroment. I have seen cases of high blood pressure, who upon return from a change of environment have a much lowered blood pressure.

We classify essential hypertension as benign and malignant. The benign becomes malignant, when the patient develops retinal changes.

Question. Will alcohol cause myocarditis?

Answer. I do not believe that mycarditis can be caused by alcohol alone. I knew of a man who for forty years, did not know what it was to go to bed at night sober. We cannot tell how tobacco and alcohol will act on an individual.

Question. When is venesection advisable?

Answer. When we have acute, congestive failure. Venisection is dangerous in cases bordering on uremia. In congestive heart failure, bleeding helps the patient very much.

SOME OBSERVATIONS ON CARDIAC PAIN

LOUIS FAUGERES BISHOP, M.D.
LOUIS FAUGERES BISHOP, JR., M.D.
NEW YORK

Members of the Oklahoma State Medical Society, I am certainly highly appreciative of the compliment of the invitation to speak to you. I am also conscious of the fact that cardiology has interested many of you. In looking over the Oklahoma State Medical Journal I have seen contributions from here on this subject, so I know that my subject is far from being a new one. I have purposely used the term "cardiac pain" in preference to angina pectoris and believe that as far as possible we ought to speak of pain of cardiac origin due to whatever we can best assume as an etiological basis. There has also grown up in the public mind the belief that in referring to angina pectoris we are always speaking of a fatal disease, which is far from being the case.

I had always thought that the first description of cardiac pain had been made by William Heberden in 1768. Only a few days ago an associate of mine told me that this was not the case and that William

Harvey had observed this and described it 100 years previous. As I believe this to be the earliest description of pain associated with coronary occlusion and rupture of the heart I would like to quote it:

"I add another observation. A noble knight, Sir Robert Darcy, an ancestor of the celebrated physician and most learned man, my very dear friend, Dr. Argent, when he had reached to about the middle period of life, made frequent complaint of certain distressing pain in the chest, especially in the night season; so that dreading at one time syncope at another suffocation in his attacks he led an unquiet and anxious life. He tried many remedies in vain, having had the advice of almost every medical man. The disease going on from bad to worse, he by and by became cachectic and dropsical, and finally grevіously distressed he died in one of his paroxysms. In the body of this gentleman, at the inspection of which there were present Dr. Argent, then president of the College of Physicians, and Dr. George, a distinguished theologian and preacher, who was pastor of the parish, we found the wall of the left ventricle of the heart ruptured, having a rent in it of size sufficient to admit any of my fingers, although the wall itself appeared sufficiently thick and strong; this laceration had apparently been caused by an impediment to the passage of the blood from the left ventricle into the arteries."

The next great contribution to cardiac pain was made by William Heberden who so exactly described cardiac pain that this clinical description has not been improved upon up to the present time. It is interesting to note that he considered cardiac pain due to a spasm of the vessels in essence similar to intermittent claudication and the vascular crises. In 1799, Jenner described the association of pain with coronary artery disease. Almost a hundred years elapsed before a means of relieving this symptom by drugs was described and the credit for this is given to Sir Lauder Brunton who first wrote about the use of amyl nitrate for the relief of pain. His original description of the use of this drug is of great historical interest:

"On application to my friend, Dr. Gangee, he kindly furnished me with a supply of pure nitrate, which he himself had made; and on proceeding to try it in the wards, with the sanction of the visiting physician, Dr. J. Hughes Bennett, my hopes were completely fulfilled. On pouring from five to ten drops of the nitrate on a cloth, and giving it to the patient to inhale, the physiological action took place in from thirty to sixty seconds; and simultaneously with the flushing of the face the pain completely disappeared, and generally did not return till its wonted time next night." This was followed by the introduction by William Murrell of nitroglycerin as a remedy for cardiac pain.

Following these great classic original discoveries the number of contributions to the subject are legion. It is my belief. however, that it was Sir James MacKenzie that re-awakened the interest of the profession in studying this symptom complex, and in looking over the historical aspect of this subject it seems that most contributions have come from England. This is probably due to the fact that the disease is far more common in northern climates than in the tropics.

It is very hard to find an exact definition of what we mean by cardiac pain. Possibly one of the best ways of trying to define this is to consider it paroxysmal pain of cardiac origin. In this paper I am considering coronary thrombosis only as a complication of cardiac pain.

Although this symptom has been fully described since 1768, by Heberden, no one is entirely sure of the etiology of pain. Whether we endorse Albutt's views, that the aorta is the source from which cardiac pain arises, or lean toward MacKenzie's view, that pain arises from exhaustion of the heart muscle, or feel, as is the current opinion, that pain is due to inadequate coronary circulation, the etiology of pain is still an unsolved problem. In most examples of cardiac pain there is the common factor of insufficiency of the coronary circulation. All of us have noted that pain is sometimes a symptom occurring in rheumatic heart disease as well as in the degenerative forms of heart disease. To further substantiate this coronary view, Perry has recently shown that endarteritis of large coronary vessels may be caused by rheumatic infection and that precordial pain is found in cases showing this lesion. He summarizes his conclusions with the following statement: "(1) The main coronary arteries are usually affected in rheumatic carditis. (2) The lesion is a general panarteritis composed of: (a) Intimal thickening more or less cellular. (b) Degenerative and inflammatory lesions of the media. (c) Inflammatory infiltration and fibrosis of the adventitia."

This rather recent pathological contribution to coronary artery disease may ex-

plain examples of pain in rheumatic fever due to coronary insufficiency. It seems to me we are gradually working toward a more complete pathological classification of cardiac pain and that eventually there will be no such thing as unexplained cardiac pain.

Before illustrating this paper with some of our experiences I would like to say a few words concerning the difficulties in studying this symptom complex. In the first place, in spite of the various tests that have been devised to determine an individual's sensitiveness to pain no one test seemed sufficient. An example of these tests is pressure over the styloid process. Although people can probably be classified somewhat as sensitive and hyposensitive it seems to me that experience in judging the psychic make-up of a given example is of great importance in this determination. Experienced clinical judgment also often makes this observation concerning sensitivity almost without knowing why. Again we are up against the problem of what has been well named "substitution" symptoms, or something that takes the place of pain, which is a representative of pain. For example, sensations of cold or heat in the chest, or a sense of pressure, or a constriction in the throat. It has also been pointed out that in so-called hyposensitive individuals dyspnoea or only even a sensation of weakness or fatigue may entirely replace pain. Whereas in another individual perhaps more sensitive pain would have been the dominating symptom. Another great difficulty is the unusual radiation of pain of cardiac origin. The pathways have been rather clearly defined, but often pain may be contralateral, that is, on the right side instead of the left. Or there may be "inverse radiation" as in an example I have seen recently where pain radiated from the left elbow toward the heart. Often, also, pain may radiate from the abdomen toward the heart. This will be referred to later in this paper. Whether these peculiar radiations are always characteristic of hyposensitive individuals as Libman has pointed out I do not believe has been finally settled. It seems now a well observed fact that cardiac pain is rare in colored people. This has also been my experience in a clinic where a fairly large number of colored patients with cardiac diseases are observed. Anthropologists have also noted that the male Pueblo Indians are hyposensitive to pain. I would be interested to know whether in your experience here in Oklahoma with Indians if cardiac pain is relatively rare.

I would now like to briefly review with the aid of some slides a recent analysis of 100 cases where cardiac pain was the prominent symptom. An arbitrary clinical classification was first made: Hypertension t w e n t y-t w o. Arteriosclerosis twenty-nine. Syphilis, two. Rheumatic, four. Thyroid, one. Coronary pathology, two. Angina pectoris, twenty-six. Obesity, one. Effort syndrome, four.

About half of all the patients gave a family history of cardiovascular disease. Pain was noted present, particularly in brain workers and people under the stresses and strains of modern life. Exertion was an exciting cause in all groups. The hypertensive group showed the highest mortality and the arteriosclerotic group the lowest mortality. In this group which we have called the angina pectoris group we are far from being entirely certain that in every case the pain was in reality of cardiac origin. However, fifty perecent were improved and four were reported as being symptom free. The electrocardiographic findings study was noteworthy in that forty percent of the angina pectoris group showed no abnormality. In the electrocardiographic study of fatal cases serious changes were seen in all groups, with the exception of the angina pectoris group where two out of four showed abnormality of a grave nature. Eleven out of twenty fatal cases manifested depression of the T wave in lead 1 and 11.

To determine whether pain is of cardiac origin or not is often difficult. The most difficult differential point being whether the pain is referred from the abdomen or from the heart. So important is this differential diagnosis between abdominal and cardiac pain that a method of differentiating the two has been suggested by Levine and others. This is to inject one c.c. of epinephrine sub-cutaneously, with a subsequent rise of blood pressure and increase of pulse rate. The individual suffering from cardiac pain had a typical pain resulting from the injection, the control series did not. They suggest the use of this method in doubtful cases. We have had no experience with this test and only mention it because it may prove exceedingly useful in doubtful cases. I do not believe, however, it is entirely without danger.

On my service at Bellevue Hospital,

where we have every facility at hand for diagnosis, recently we sent a patient with coronary occlusion to the operating room with a diagnosis of ruptured peptic ulcer. The type of pain and the general picture of these two conditions being so similar that a differential diagnosis was not made.

Frequently it is also difficult to interpret the milder pain seen in gall bladder and gastric or duodenal disease. In my experience during the past few years in a clinic devoted to the study of peptic ulcer I have been impressed by the difficulty in differentiating between the pain of peptic ulcer and cardiac pain. A striking example of this is were a colleague of ours who had been under treatment for peptic ulcer for some time died suddenly while on a trip to Florida, of coronary thrombosis. Another confusing point of which we have seen several examples is where undoubtedly these two conditions were present in the same individual. The differential diagnosis from neurological conditions is also often exceedingly difficult. We have seen recently an example of a woman who could simulate attacks of cardiac pain so closely that she had been given a positive diagnosis of pain of cardiac origin by many physicians throughtout the United States. A very intelligent neurologist in New York uncovered the fact that this patient was addicted to drugs and, fortunately, this resulted in a complete cure.

Many other examples of similar nature could be used to illustrate the difficulty in differential diagnosis. I agree with Dr. Harlow Brooks that all terms such as "psuedo" cardiac pain, or "functional" cardiac pain as far as possible should be abolished. In spite of the fact that we may occasionally create a neurosis it is better to consider pain that has the classical syndrome of cardiac origin as truly cardiac until proved otherwise.

I do not want to go into too much detail in regard to the drug treatment of cardiac pain except to tell you what has been our own experience in the management of this symptom complex. I am dealing here principally with the ambulatory form of pain and not that in which the possibility of coronary thrombosis may be a factor.

Our method in the use of nitroglycerin differs somewhat from its general usage. We use it in very small doses—1-225 grain —which we put up in conveniently small bottles. We have found it exceedingly difficult to teach people how to use nitroglycerine and a great deal of time has to be devoted to this phase of the treatment of pain. To eliminate the fear of the patient in the use of this drug I have occasionally had to take a dose myself in the office to prove its harmlessness. We also have found it very useful to teach people to use nitroglycerin before attempting to make some effort which had previously produced an attack of pain. It is very important to be sure of the freshness and strength of the nitroglycerin because I cannot imagine anything more pathetic than some person suffering from true cardiac pain trying to relieve himself with an inadequate remedy.

Next to nitroglycerin we have had a great deal of success with castor oil, particularly in the hypertensive group of patients suffering with cardiac pain. Some of these are given serial doses of castor oil, every other day for three doses and then they are taught to use it at least once a month. It has been our experience that they are very often free from pain for some time following the use of this remedy.

Another drug which seems to be of very definite benefit in the relief of cardiac pain in theobromine. We use the five grain compressed tablet (theobromine and sod. salicylate, Merck), with definite instructions that it ought to be taken after meals, suspended as fully as possible in a half a glass of water. The method of taking this is as important as the drug itself and it seems to us that many people who fail to get results with theobromine is due to the fact that they have not been instructed in the use of it. This drug may also produce great discomfort if taken in solid form.

One of the great difficulties in the treatment of this symptom is the question of prognosis. In all cases it is incumbent upon the doctor that he should not only consider his words but also his manner of expressing them. I am quoting here MacKenzie's own words concerning his methods of handling the prognosis question so difficult in the treatment of cardiac pain: "The idea is common that anything wrong with the heart carries with it the possibility of a sudden early death. As I have already pointed out, in dealing with cardiac pain the injudicious prognosis of a doctor may have calamitous results. When, therefore, a patient suffers from a pain which he or his doctor may consider to arise from the heart the possibility of cardiac pain occurs to both and the patient is of-

ten extremely depressed when he gets it into his head that he suffers from this trouble." MacKenzie's method was to explain to the individual in simple language that the changes in his heart were a little more advanced than the vascular changes in the rest of his body, which accounted for his symptoms. By explaining the patient's condition carefully and in a very simple fashion he removed the element of fear so often associated with mystery. We also have found that this is the best method of handling the prognosis question. In general we avoid as nearly as possible any prophecy of evil.

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121 East 60 Street.

FRACTURE CLINIC—DISCUSSION OF DELAYED AND NON-UNION

PAT FITE, M.D., F.A.C.S.
MUSKOGEE

Since the advent of the machine age the number and variety of fractures has greatly increased and the fracture problems and the sequelae of handling them have increased in proportion. The essential teachings of the writers of a hundred years ago are still in vogue today, particularly those pertaining to splinting and the avoidance of gross motion at the site of fracture. At the present time the histological and pathological features of bone repair and the failure of bone repair are much better understood although much is yet left for solution.

When a fracture occurs the ends of the small vessles are broken across and a clot forms about the ends of the bone fragments. Capillary buds go out from the bone and form the tissues about the bone into this clot until the entire distance is bridged across. Connective tissue forms about the capillary buds coincident with their formation. If for any reason the entire breach is not bridged by this granulation tissue non-union will develop and a condition analogous to that of chronic ulcer of the leg and chronic fistula takes place, *namely* the capillary buds do not bridge the gap and turn back on themselves in loops becoming terminal vessels. Up to this point the process of bone repair is essentially the same as tissue repair elsewhere in the body.

From this point on the process is peculiar to bones. If the ends of the bone are directly together, with practically no displacement, they can heal almost by first intention, but the process is the same in any case. Where the space is filled with granulation tissue circulation comes from the periosteum, marrow channel and the Haversian systems. The second step is the development of soft callus, next hard callus with the Haversian systems roughly at right angles to the long axis of the bone, and later the actual formation of bone in which the Haversian systems become parallel to those of the bone fragments. There is no easy way of distinguishing between these various steps of repair. About two-thirds of the circulation between the edges of the bones comes from the medullary canal. About one-third comes from the periosteum and the muscular tissue about the bone at the site of fracture, together with the Haversian systems. Up until the point of actual hard bone formation with the Haversian systems parallel to the long axis of the bones, the process of repair may be reversible and if too much motion is allowed non-union may result.

Some of the difficulties in delayed bone union come from too early mobility of the fracture. We often say that the average Colles fracture is solid in three weeks. Perhaps it is, but sometimes it is not solid for ten weeks. Consequently fractures should be individualized and due regard given to the rate of bone repair.

When a fracture does not unite it is for one of two reasons. It is either mechanical or chemical. Should a muscle or tendon be caught between the ends of the bone it is obvious the granulation tissue cannot force its way through this obstruction and non-union will result. Too much manipu-

lation the first two or three weeks in attempting better approximation, often leads to delayed or non-union. Too much manipulation at a late stage, even after hard callus has formed may bring about a reversal of the process and lead to non-union. Probably the most of our non-unions or delayed unions are the result of compound or comminuted fractures and the frequency of non and delayed unions at the present time is no doubt due to the fact that we are having so many automobile injuries and injuries from machinery of all types. In the consideration of the chemical reasons for non union, considerable work has been done in various medical centers in the past decade in the study of the biochemistry of bone repair. This has practically been done in the past five or six years. Campbell and Albee have been working on this problem for at least the last decade. Campbell believes in the onlay and Albee in the inlay graft Both have been markedly successful in the handling of ununited fractures by his respective method. It has been understood for many years that under certain conditions of interference with the circulation actual bone is produced in the cortex of the kidney. Calcification is common in tuberculosis of the kidney. Recent experiments at the University of Chicago have shown that the transplantation of fascia into a defect of the bladder wall will bring about the production of bone and also that the transplantation of mucosa of the bladder into the abdominal wall will produce the same result and that transplantation of muscularis mucosa of the bladder will not produce this result. Also that if the bladder mucosa is transplanted for instance into the liver or spleen, bone formation does not take place. That the urine takes no part in the formation of bone in the bladder is shown by the fact if the ureters are brought through to the abdominal wall the same phenomenon occurs. The reason for all this is not understood.

Many of us have been led to believe for years that syphilis was a common cause of non union. We are constantly hearing it brought up in cases before the Industrial Commission and in the courts. Personally I have never seen a case of non union result from syphilis, and Dr. Henderson in a talk two years ago at Chicago stated that in the Mayo Clinic up to that time so far as he knew there had only been one case of non union that could actually be ascribed to syphilis.

It is believed by many that osteoblasts occur either from migration at the ends of the bones or are formed from the newly made connective tissues by metaplasia and that due to the activity enzymes produced in these cells calcification is brought about. Other workers at the Presbyterian Hospital in New York fairly recently have sought to show from their experiments that this is not the case and further that the available source of calcium at the site of the fracture is due to tissue death and that an enzyme if formed is through the death of this tissue and is probably affected in no way by the blood calcium.

The most frequent fractures are fractures in the lower and middle third of the tibia, middle third of the humerus and the neck of the femur. In the anatomical consideration of these fractures it will be noted that these non unions occur in places where the bone is largely surrounded by tendons and there is poor lateral blood supply or the line of fracture, as in the case of the neck of the femur or the tarsal scaphoid, is bathed in synovial fluid. This last seems to interfere to some extent with the proper formation of callus.

The conclusion reached almost unanimously by present day workers in this field is that there is little if any systemic reason for non-union, that bone repair or the failure of bone repair at the site of fracture is purely a local phenomenon. It has been noted experimentally that the presence of an abnormal amount of animo acid resulting from tissue destruction is inimical to the normal processes of regeneration of bone.

In this same field of chemical causes of non union are the various infectious processes and this is often seen where there is a supervening osteomyelitis in a compound fracture. The use of foreign material in an infected field, particularly if the wound is closed, even if the infection is of a very low grade, is frequently the cause of defective repair. The beef bone plates and Lane plates are probably not in themselves responsible for non unions merely by their presence but often give a site for continuation of infection and may even be productive of poor contact between the bones. Experience has shown that the average man is not in position to use the Lane plate as he should be, probably because his working conditions are not sterile as is required. We say this because of the large number of plates that we have had to remove in the past eight years.

In closing, let me say that we learn a great deal by our errors and that there are certain things that we should all avoid. Do not do too much manipulation of fragments during the period of repair. Do not do plating in the presence of suspected or probable infection. Resort to closed reduction where possible. Do not assume that a fracture has united in a given length of time. Check it by X-ray and light manipulation. Do not mistake a delayed union as a non union too soon.

FRACTURE CLINIC—OKLAHOMA CITY, MAY 12-13, 1931

S. R. CUNNINGHAM, M.D.
OKLAHOMA CITY

Dr. Pat Fite has just given a very interesting and instructive talk on non-union of fractures. I would like to emphasize that there is a great difference between non-union and delayed union of fractures.

I am quite sure that we see a great many fractures treated as non-union when in reality there is only a slow or delayed union and they should get spontaneous union.

I would also like to emphasize his statement, that one of the very common causes of non-union is the frequent or repeated manipulation of the acute fracture fragment. There has been a rapid increase in the number of fractures in the last few years. At the same time there has been a great change in the severity of fractures, that is, we are seeing far more real severe and complicated fractures than we did a few years back. There are several reasons for this—the rapid increase in the use of motor cars, modern heavy construction, cause more severe and more complicated fractures than we used to see.

I see that they are preparing here to continue with the moving picture demonstration and in the few minutes I have I particularly want to emphasize that most fractures of the long bones should be treated as closed fractures. Once in a great number of cases, it possibly is advisable to do an open replacement of the fragment ends but I never find any occasion to apply any non-absorbable material on fractured bones.

In our clinics here (and I am sure they do not differ from large clinics in other places) we find that a very fruitful source of non-union is the too often practiced open operation.

Open fractures commonly called "compound fractures" constitute about 15 percent of fractures of the femur and about 7 percent of fractures of the humerus and about 14 percent of fractures of the tibia. We find that about 11.85 percent of all fractures of bones with the shaft are open fractures.

When an open fracture is seen within a very few hours after injury the wound should be thoroughly trimmed and cleaned out and made a clean surgical wound and closed and treated as a closed fracture. This type of fracture is oftimes best treated by skeletal traction.

SECONDARY FACTORS IN SEASONAL HAY FEVER

HERBERT J. RINKEL, B.S., M.D.
AND
RAY M. BALYEAT, M.A., M.D., F.A.C.P.
Lecturer on Diseases Due to Allergy, University of Oklahoma Medical School
OKLAHOMA CITY

The etiology of seasonal hay fever is well established. The role of secondary factors, however, is not so well understood so that many have difficulty in evaluating the importance of the various factors that play a part in the production of seasonal hay fever symptoms. One is not justified in stating that a patient failed to receive benefit from seasonal hay fever treatment unless that statement also specifies the consideration given not only to the primary pollen factor or factors but to the handling of secondary factors. As a means of trying to determine the relative importance of various secondary factors we have made a detailed analysis of 201 seasonal hay fever patients, all of whom presented themselves for the first time or were completely rechecked both by the scratch and the intradermal method during the season of 1930. They have been chosen in part from those presenting themselves because of hay fever symptoms during the tree season, in part from those with symptoms in the grass season, and also a series whose symptoms occur only during the thistle and pigweed, or the ragweed, season.

POLLEN THE SOLE FACTOR

In the series of cases studied only one patient was found sensitive to pollen only. Logically it ought to be this way. That is, a patient born with the ability to become sensitive to pollen ought to become sensitive to other substances, namely, animal

dander, food or dusts, and apparently they do. The fact that one patient was found sensitive to pollen only does not mean that pollen was not the sole contributing cause of the hay fever symptoms in others who were definitely sensitive to substances besides pollen. For example, we found a few cases who were very sensitive to pollen and slightly sensitive to animal dander and to foods. In all probability the moderate degree of sensitivity to foods and animal dander in such cases plays but little if any part in the production of their symptoms. As will be shown later the majority of cases gave marked reactions to other inhalants or foods.

MULTIPLE POLLEN SENSITIVITY

Multiple pollen sensitivity is very much the rule. Of the 201 cases studied ragweed was considered the primary pollen factor in 123, or 50.9 per cent, while the pigweeds and thistle were considered prominent in 53 and 34 patients respectively. It was interesting to note that grass could be considered the primary factor in only 12 cases. Oak was very important in 16 cases, elm in 4, maple in 4, and cottonwood in 9.

In determining the primary pollen factors one must take into consideration the date of onset of symptoms and the positive test findings. This is likewise very important in deciding the possibility of secondary pollen factors. We find in our study, for example, many patients who show a marked reaction to grass or the pigweeds, but who do not have symptoms until the ragweed season. It is likewise true that many of our thistle patients show a definite positive skin reaction to a number of the grasses but they manifest no clinical symptoms until the thistle is pollinating. We believe that in these cases the pollen from the grass or the pigweeds, whichever it may be, or both, may not irritate sufficiently a normal mucous membrane of the nose to produce symptoms, but after the ragweed begins to pollinate and the nose is made markedly irritable then the grasses or pigweeds will irritate the abnormal membrane and then become very definite secondary pollen factors. We consider in this series grass a definite secondary pollen factor in 115, pigweeds in 83, ragweed in 51, thistle in 32, and trees in 8. Our observation leads us to believe without question that the degree of contact has much to do with determining the pollens to which patients will become sensitive. For example, a patient who lives in the Russian thistle district, who is born with the ability to become sensitive, usually becomes sensitive to Russian thistle; likewise those who live in the Johnson grass district have a tendency to become sensitive to Johnson grass, etc.

Probably the most interesting clinical phase of the multiple pollen factors are the patients who have, for instance, ragweed seasonal hay fever but who fail to obtain benefit unless the secondary pollen factors are cared for by pollen therapy. Most patients who come into the clinic, who have marked hay fever symptoms during the Fall of the year, will tell us that their symptoms appear from about August 15th until frost, but on close questioning we will find that they may have mild hay fever symptoms in June, July or the early part of August, which is evidence that the grasses, pigweeds or other pollen to which they are sensitive, that act as secondary factors, are actually causing some symptoms, but they are mild and the patient pays but little attention to them. We often elicit on close questioning a history that these same patients suffer rather severely from what they believe is an acute infectious rhinitis in February, March or April each year. On testing we find many who give such histories markedly sensitive to elm, cottonwood or oak. Their symptoms could easily be due, and are in many cases, to the tree pollen.

THE DOUBLE ROLE PLAYED BY THE COTTONWOOD TREE IN SEASONAL HAY FEVER

Throughout the western half of the territory spoken of as the Great Southwest the pollen from the male cottonwood tree plays an important part as a primary factor in the cause of seasonal hay fever. In the state of Oklahoma there are two species of the cottonwood tree, namely, *Populus deltoides* and *Populus virginiana*, but in Colorado, according to Waring[1], there are nine. In the western half of Oklahoma, Kansas, New Mexico, and in the state of Colorado, the cottonwood tree is used extensively as a shade tree by the farmer, and in towns and villages. It grows extensively along streams. Its use as a shade tree brings it in close contact with the possible sufferers from hay fever.

The tree is dioecious in type, that is, the female tree is a distinct one from the male. The pollen of course is produced by the male tree. The average date of onset of pollination is April 3rd. It is a prolific

FIGURE 1.

Cottonwood (Populus deltoides)

The cottonwood tree (upper left view) grows along streams and is used extensively for shade in western Kansas, Oklahoma, New Mexico and Colorado. The staminate flower (lower right) is very brilliantly colored. It produces enormous quantities of dry pollen, which is frequently carried many miles by the wind. The pistillate flower (lower left) is inconspicuous and after fertilization appears in the form of pods (upper right) from which is liberated the cotton that is so disturbing to housekeepers.

The pollen from the cottonwood tree is a common etiologic factor of spring hay fever beginning the first of April. Patients are not specifically sensitiveto the cotton liberated by the female tree but it acts as a nonspecific factor, frequently accentuating the symptoms of those who suffer from hay fever during the heavy grass season (month of May).

pollinator and the pollen is small, which allows it to be carried into the air for several miles. The period over which the tree pollinates is about three weeks. The cotton produced by the female tree begins to blow about the 1st of May. Attached to the seed are a large number of small cotton threads, which makes it very fluffy, so that the wind can distribute it over large areas with ease. It has been reported by Waring' that occasionally a patient will become sensitive to the cotton. However, the cotton, which is produced by the female tree and blows extensively, usually acts as an irritant to those who suffer from seasonal hay fever, in a nonspecific way. The fine lint will irritate the mucous membrane of the nose that has been made irritable from the grasses that are blooming at the same time, just the same as will fine dust and lint from books and clothing.

It is interesting to note that in the cities and villages there are about twelve male cottonwood trees to one female. This is largely due to the fact that housekeep-

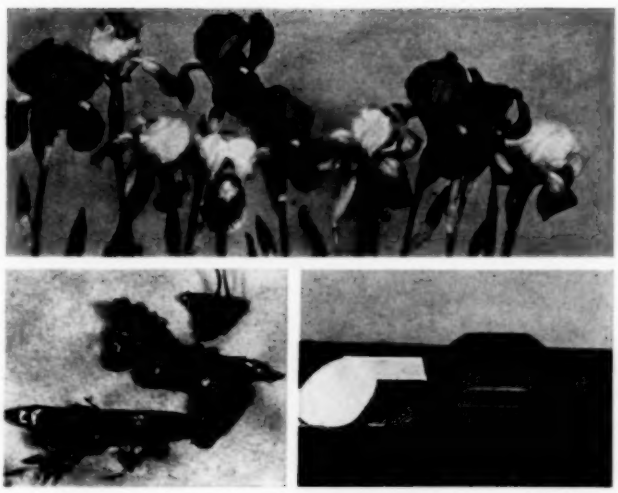

PLATE I. THE SOURCE AND USE OF ORRIS ROOT

Iris plants *(upper view)*, the rhizome of which *(lower left)* is dried and ground up to produce orris root. Powdered orris root is used in highly scented cosmetics *(lower right)* as a perfume fixative.

ers soon find that the cotton produced by the female tree is very annoying, and naturally the trees are cut down. In other words, the majority of the cottonwood trees in the towns and cities are hay fever producing ones. Along the streams we find about an equal number of male and female trees.

ORRIS ROOT AS A SECONDARY FACTOR

In this series of cases 72 patients were found sensitive to orris root by either the scratch or intradermal method of testing. This number may seem high but when we consider the prevalence of orris root it seems logical. The average adult is in contact with orris root throughout the business day and in his home. Naturally one would expect sensitivity more among the city dwellers because of their increased social contact, and this is the rule, but in a number of instances we have found steel workers, farmers and brakemen sensitive to it. The majority of these patients may be controlled by the strict elimination of orris root in their own home and avoidance in the hay fever season of contact with orris root in public places, such as drug stores, perfume counters, barber shops, etc. A great number need desensitization to orris root as well as to the primary pollen. Elimination, of course, should first be tried, and then if necessary treatment may be instituted.

It is not uncommon to have the history of a patient who is having perfect results with seasonal hay fever treatment, who gets in difficulty on going to a party. One such patient stated that approximately 10 minutes after entering the crowd she began to have symptoms and these symptoms did not cease when she went home but persisted for three or four days. Here we have a good illustration of prolonged symptoms that may be induced by short contact. Males may have as much difficulty from orris root as females.

INCIDENTAL PROTEINS COMPLICATING SEASONAL HAY FEVER

By incidental proteins we refer to such products as tobacco, flaxseed, pyrethrum and other proteins that cannot be classified either as a food, animal dander, etc. In our series of cases pyrethrum is the most common incidental protein, being positive in 31 cases, while flaxseed was found to be a factor in 7, and tobacco played a role in 4. Pyrethrum is the basic ingredient in all fly powders and insecticides and is produced from chrysanthemum (*Chrysanthemum coccineum*). As a rule patients who are sensitive to the composite group ought to have difficulty with pyrethrum. Its season of greatest use corresponds to the various pollen seasons. It is commonly applied by closing the windows of the room and saturating the air with the powder. One can readily see that where it has been used in this manner that a ragweed sensitive patient will become sensitive, or if sensitive, have difficulty, because of its presence. Some rugs are saturated at the factory with pyrethrum to moth-proof them. There is no need of desensitization in cases sensitive to pyrethrum. Strict elimination is the satisfactory procedure.

Flaxseed is used in beauty parlors, in certain breakfast foods and chicken feeds, and its classical use is that of a poultice. One naturally concludes then that the most likely contact will be in the druggist, the chicken grower, the cosmetic specialist, and among those who use cereals containing flaxseed. Routine testing for flaxseed is in order. If sensitivity exists to this protein it is usually quite evident and strict elimination will take care of symptoms.

Tobacco occupies a minor role and is chiefly noted among those who do not smoke but who occasionally come in contact with tobacco fumes.

THE IMPORTANCE OF ANIMAL DANDER

One hundred and ninety of these patients showed a sensitivity to various animal danders. This is a greater incidence of positive reactions, considered as a group, than any of the other etiological groups. This fact is of utmost importance. Time and again we have seen seasonal hay fever patients who were having difficulty in spite of treatment, whose symptoms clear up when they have eliminated contact with the various animal danders. For purpose of illustration I shall cite two cases.

Case 1. Mrs. G. M. R., age 34, came to the Clinic because of hay fever from August 15 until frost. In the course of testing we found her extremely sensitive to duck, goose and chicken feathers, and dog hair.

Treatment was instituted and she returned to her home physician. About 3 weeks after she had been on treatment she made a trip to the wholesale house as a purchaser of fur trimmed winter coats. She was free of symptoms on entering the wholesale house. In about 10 minutes she began to have difficulty and it was practically impossible for her to complete her purchases, for, as she stated, "my eyes watered so I could not study the fabrics or the design." In two or three days the symptoms had cleared.

Discussion. This experience stimulated the patient to determine whether the pet dog which had been removed from the home could be a cause of symptoms. Here again she found that contact produced severe symptoms. She reported to us that when she eliminated the dog and other various animal danders she continued through the season with exceptionally good results.

Case 2. Our second patient, Mr. J. M. S., age 42, had suffered from seasonal hay fever for a number of years. On the opening day of the ragweed season he was attempting to do some work about his garage and by 9 o'clock in the morning his symptoms were so severe he was unable to continue. On testing this man we failed to find a ragweed sensitivity by the scratch test, and the intradermal method was questionable. However, he was a six plus to goose feathers, and on removal of the feathers his symptoms cleared up. Within 3 days there were no symptoms referable to hay fever and he continued through the season with perfect results.

Discussion. The importance of the animal danders in these two cases is no doubt greater than in the average case but illustrates the need for thorough testing and removal of animal danders to which the patient is sensitive.

ROLE OF FOOD AS A SECONDARY FACTOR

Eyermann[2] called attention last year to the importance of food in seasonal hay fever patients. For the past several years we have been testing patients with foods and have found the food factor of such importance that all seasonal hay fever patients are now being tested not only by the scratch method but by the intradermal. On analyzing these findings we find that 164 were sensitive to various vegetables, while fruits were positive in 133 patients. Cereals were found to be a factor in 90, fish played a role in 75, nuts in 68, condiments in 53, and meats in 49. Wheat showed a positive reaction in 95 patients, eggs in 57 and milk in 34.

When we consider this group of patients as a whole we find that only 3 of the 201 patients failed to react to some of the food group. Eyermann[2] has shown very definitely how patients who have been desensitized without good results have been able to pass through the season free of symptoms when the food factors have been thoroughly controlled.

Case 3. We have a patient, W. T. R., age 24, whom we were unable to build because of sensitivity to wheat. On strict elimination of wheat from the diet we were not only able to build her to a high dose of the pollen extract but we were also able to free her of her hay fever symptoms.

Case 4. Another patient, H. McC., age 30, reported at the end of the season that on an occasion or two he thought that diet was unnecessarily strict and he would partake of foods to which he had been found sensitive. On each occasion he suffered hay fever symptoms for a day or two. In his case this was due to navy beans, watermelon and celery.

Discussion. It will be noted that the meats, fish and nuts are not a factor as often as are vegetables and fruits. The protein content is less among the vegetables and fruits and therefore the elimination of foods on the protein basis alone is not apt to secure results comparable to those where the diet is arranged after testing with all the foods.

SUMMARY

When we consider the foregoing findings in a large group of seasonal hay fever patients it is obvious that while the symptoms of seasonal hay fever may be referable to some of the wind-borne pollinated plants, it is not difficult to see that many factors besides the specific pollen must be considered in the treatment of these cases. From time to time reports and figures are given on the results of seasonal hay fever treatment. It is obvious that if these figures are obtained from patients who have not been tested to all of the pollen, all of the animal danders, incidental proteins, orris root, and foods, that the patient has been treated without a full determination of the etiology. In other words, the patient is being treated on an empirical basis rather than on a specific one.

The progress being made in the treatment and handling of seasonal hay fever patients has been so rapid that a procedure which was considered correct a year or two ago may be no longer in good form.

We would emphatically state that comparisons of the benefit cannot and should not be considered unless all of the specific etiologic factors have been considered. The assumption that patients who have hay fever in the ragweed season due to ragweed only is unjustified. There is little question but what the majority of these patients are sensitive to ragweed, but there are many other causes which must be considered and eliminated. The role of animal danders, orris root and incidental proteins is fairly well understood, but the importance of food has not received due attention. We believe on the basis of these findings and the results in treatment of these patients that a strict and thorough elimination of the various foods to which the patient is sensitive are of equal im-

portance with other treatment. We also know that where the specific foods have been eliminated that systemic reactions and difficulty in building are more apt to be avoided.

CONCLUSIONS

1. Pollen as a sole cause of seasonal hay fever, as demonstrated by scratch and intradermal testing, is exceedingly rare, occurring in only one patient.

2. Multiple pollen sensitivity is the rule, and in our group the most common primary pollen was ragweed; in the secondary pollen group grass was the most common.

3. Orris root is of secondary importance in at least 30 per cent of the patients, and desensitization must be considered in at least 10 per cent of all patients.

4. Pyrethrum is of the most importance as an incidental protein complicating seasonal hay fever and is found of course among those sensitive to the Composite group. Flaxseed and tobacco play a minor role.

5. Animal danders have been found positive in a greater number of patients than any other etiologic group and their elimination must be considered in detail.

6. Positive reactions from foods are second only to the animal danders. When we classify the various food groups, vegetables and fruits appear to be of the greatest importance.

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MEDICAL ASPECTS OF GASTRO-DUODENAL ULCER

ARTHUR W. WHITE, A.M., M.D., F.A.C.P.
OKLAHOMA CITY

The form of the subject "Medical Aspects of Gastro-Duodenal Ulcer" indicates a treatise on treatment rather than a discussion of principles.

With the enormous amount of literature on this subject for the past many years, with many conflicting articles trying to evaluate the various types of therapy, some attempting to prove the wondrous merits or the hideous mutilations and defects of some special operative procedure, or some selected diet or some drug, others trying to show that certain bacterial, mental, neurogenic factors, or circulatory disturances are the sole etiological factors of the disease, others insisting that in the X-ray lies the sole hope of correct diagnosis, others that it is often valuless, others that certain special tests are of absolute necessity—one can not help feeling the essential and inherent difficulties of such a discussion.

It seems essential, before taking up the question of treatment, to refer briefly to some of the questions in the field of etiology. The generally accepted explanation is, that the immediate cause of the condition is the digestion of a certain portion of the mucosa by the proteolytic enzyme of the stomach, or by the corroding effect of the hydrochloric acid, but as to the contributing causes, the views are many.

Disturbances of the circulation and consequent lowering of the vitality, as first suggested by Virchow, seem to be a plausible factor in many cases, but whether this is due to thrombi or to emboli, constriction of the blood vessels, or strain and interference of the circulation to the lesser curvature of the stomach, the pyloric portion and duodenum, on account of the peculiar distribution of the blood vessels and the consequent interference by position and gravity, it is often impossible to say.

Certain experimental work in this field has shown that ulcers can be produced artificially by the production of a thrombus or local destruction of tissue as by silver nitrate, but these ulcers heal spontaneously very rapidly, although the healing may be greatly retarded by the administration of hydrochloric acid.

Many still believe with Eppinger, that a marked instability of the sympathetic and vagus systems is the underlying cause.

Dr. Harvey Cushing has recently pointed out that ulcer of the stomach is sometimes found with tumors or disturbances of the dionecphalon or "tween brain."

Disturbances in the motor sphere, functional or organic abnormalities, and peculiarities in the form of the stomach as ptosis or congenital malformations: all of these have been regarded as factors of importance.

That the essential role is played by bacteria has been insisted on by many, some considering them as specific, others that they play a secondary role, thereby inhibit

healing and bring about a chronicity. As regards the former, many believe with Rosenow, that streptococcus of specific strain is essential to the development of an ulcer. It is well to remember in connection with this, that the gastric veins are freely open to any substance coming from the spleen and that this, as Gibson insists, may give rise to infected emboli, and further, that "the anatomical distribution of blood supply of the gastric mucosa is a prime factor in determining not only the location but the cause of ulcer" as Hoffman and Nather have shown.

As regards symptoms, again we see a great variance and nothing that is wholly dependable in all cases. True, a certain syndrome, *viz.*, that of chemical distress and periodicity, is considered characteristic, but in many cases this is absent. Some present no symptoms until hemmorhage or perforation occurs, others present certain outstanding symptoms which are unique as for example, diarrhea.

Hence, the reason for uncertainty and dissatisfaction giving rise to many varied opinions, is not hard to find—for treatment, without knowing the cause, without being sure the symptoms are characteristic and without being certain beyond a reasonable doubt of the diagnosis, must of necessity be unsatisfactory when considered in the abstract.

What then, can be expected of any treatment?

Obviously any treatment to be considered must give promise of eradication of the ulcer only by furnishing such measures as promote the healing of the ulcer and by removing its complications or hindrances without regard to some possible hidden indirect cause.

Then the question so often contemplated in improper form "should peptic ulcer be treated medically or surgically" is more easily answered when presented thus—"should this particular ulcer, with the recognizable condition and complications that accompany it, be treated medically or surgically?"

This cannot be answered without a thorough understanding of the conditions present and the balancing of one type of treatment against the other, with reference to risk to life, discomfort, time, after effects on the patient, and the special characteristics of the case.

For many years two essential factors have been recognized in the chronicity of peptic ulcer:

1. The destruction of an area of mucosa in the stomach or duodenum.
2. The destructive action of the gastric juice on such necrotic areas as exist.

Well nourished and otherwise undamaged tissue resists the action of the gastric juice, whether this tissue is protected by normal covering or not. Hence, the explanation for the rapid healing of experimental ulcers.

Ulcers that have occurred without symptoms and that have healed spontaneously are numerous. The adjacent tissue to and covering the surfaces of such ulcers, has sufficient vitality to resist the action of the peptic juice. Abundant evidence is at hand to demonstrate that tissue, lowered in vitality from any cause, is readily susceptible to the corrosive action of the gastric juice in proportion to the diminution of the vitality of the exposed tissue.

The digestive or corroding action of the gastric juice is due to the solvent action of the pepsin in the presence of free hydrochloric acid. As a destructive agent then, gastric juice is absolutely inert in the absence of free hydrochloric acid and further, pepsin is not activated by the presence of combined acid, acid salts, or organic acids.

It is obvious that when the vitality of tissue is lowered sufficiently to render it susceptible to gastric juice digestion, the greatest efficiency of treatment cannot be attained without bringing about an absolute constant neutralization of the hydrochloric acid.

Time does not permit the discussion in any great detail of the medical management—suffice it to say that frequent feeding of bland food, which in case of any degree of obstruction should be liquid, preferably milk, with the administration of sufficient alkali, as sodium bicarb, bismuth salts, mag-oxide, calcium salts, etc., between feedings, to insure complete correction during the waking hours, with as nearly absolute and continuous rest as can be obtained, is the basic plan for procedure. The stomach should be aspirated and the contents examined sufficiently often to determine for a surety, that the alkalies are administered in sufficiently large doses to accomplish the desired change,

and yet not sufficiently strong to over correct the secretions, as to wholly interfere with digestion or render the condition known as alkalosis possible. When the free hydrochloric acid is controlled, the greatest hindrance to the healing of the ulcer, that is amenable to medical or surgical control, is removed. The conditions for the healing of the ulcer are rendered as ideal as possible in the light of our accumulated knowledge. But it is important enough for emphasis, at this point, that a reduction of free hydrochloric acidity, short of its complete neutralization, does not in the least diminish the peptic activity of the gastric juice.

Sippy first demonstrated in a large series of cases, that as a result of the constant protection of the ulcer from digestive juice contact, one of the most common and serious complications of peptic ulcer, *namely* pyloric obstruction, will yield rapidly in a large percentage of cases.

In 80%—85% of all cases of pyloric obstruction, the obstruction is overcome within three weeks to such an extent that a full meal will pass thru the pylorus within the seven hours allotted time. In these cases the obstruction is due to muscle spasm, acute swelling, and occasionally, to a local pertonitis. In the remaining cases, a cicatrix at the pyloric ring produces such narrowing that these yield very slowly, and in at least fifty percent, surgical help is required.

In the case of gastroenterostomy, as indicated in these cases, *i. e.*, for the relief of pyloric obstruction, greater efficiency may be secured and the end results improved if the pylorus is not closed, and there be included in the after treatment of the case, an accurate neutralization of the hydrochloric acid.

The higher the grade of obstruction, the greater the help from operation, in that the contact of the irritant contained in the gastric juice is reduced in time, although this in itself does not insure healing, as there has been simply a conversion from an obstruction to a non-obstructive type of ulcer.

Another distressing complication is hemorrhage, which however, produces a low mortality. It is estimated that not over 15% of hemorrhage cases result fatally. Death resulting from a single hemorrhage occurs before any treatment can be instituted.

Unquestionably in repeated hemorrhages, the peptic destruction of the thrombus, before it has become vitalized, is an important factor, so that the rational treatment following hemorrhage is the rapid and constant neutralization of the hydrochloric acid to protect the walls of the stomach from the rapid disintegrating action of the gastric juice. This, with morphine and absolute rest, is usually sufficient. Hourly feedings of small quantities of milk or strained gruel can usually be instituted within 36 to 48 hours after the cessation of the hemorrhage. A low blood volume favors control of the hemorrhage so that intravenous injections of large volumes of fluids is not indicated. The results of surgical intervention are so discouraging that it is extremely rare that surgical interference is advisable.

There are other complications, as perforation, perigastric abscess, suspected developing carcinoma, which are strictly surgical as soon as diagnosed, but it should be borne in mind that the follow-up treatment should include an active corrective management, to insure the best results. It is certain, however, that a period of haphazard careless treatment with its consequent failure should not constitute an argument for precipitate surgery. Sir Berkely Moynihan states: "It is at least arguable that the necessity for surgical relief in many cases is due to a too perfunctory trial of medical treatment. It is best to have no half way measures."

Last year Ralph C. Brown made an extensive survey of cases treated by Sippy and Brown for a period prior to 1927. Questionnaires were sent out to 1900 patients with 1224 replies received. From this study he reports good results in 66% of cases, fair results in 10%, and poor medical result in 20%. Hence, it may be concluded, that approximately 20% of ulcer cases admitted to hospitals require surgical treatment. Brown concluded his report with the statement: "Good cooperation between internist and surgeon is of the utmost value and rarely should a patient be placed in the surgical category until after a period of preliminary medical treatment."

The follow-up treatment of all cases, complicated or uncomplicated, whether

treated during the active stage, medically or surgically, is of utmost importance, as the conditions which produced the original ulcer may again produce the condition, so that neutralization should be continued over a long period. The length of time required for a peptic ulcer to heal, depends on the size, the amount of induration, and the accuracy shown in elminating unfavorable conditions and in carrying out the management. No drug or operation directly heals the ulcer. All that medical or surgical treatment can do to promote healing is to eradicate those conditions which prevent healing.

No single procedure can immediately bring about the desired results; it requires patience, careful continuous observation over a long period of time as it is not sufficient to cure the ulcer, but to reconstruct the functional habit of the stomach in order to prevent a recurrence of the ulcer. Consequently, any surgical procedure must, by the very nature of things, be an adjunct to the routine management and cannot in itself be depended upon to bring about a positive prompt cure, and is to be considered in selected cases only. The surgical interference should be determined on the merits of the case (the particular type of operation should be left to the judgment of the surgeon, who should by all means be of wide experience and developed judgment). The after care should be in the hands of one thoroughly conversant with detailed requirements essential in maintaining an absolute chemical correction.

In conclusion—the last word has not been said as regards to cause or conditions affecting the healing process but whatever associated treatment, medical or surgical, as determined by the exigencies of a given case, may be resorted to, the first principle in treatment is the neutralization of the hydrochloric acid for by this:

Pain is relieved.

Osbtruction most definitely influenced.

Recurrence of hemorrhage prevented.

Penetrating types of ulcer rapidly influenced and

The healing of the ulcer occurs.

GASTRO-DUODENAL ULCER, SURGICAL ASPECTS*

P. P. NESBITT, M.D,, F.A.C.S.
TULSA

A chronic gastro-duodenal ulcer, known also as a peptic ulcer, is a very serious condition. It is serious not only to the victim harboring it, but to his family and to his medical attendant. To effect a cure requires full cooperation of the sufferer and his family and intelligent and long continued supervision by the doctor.

Medical and dietetic treatment is the sheet anchor in curing this condition. Most surgeons do not regard surgery as a cureall for gastro-duodenal ulcers, but as an aid to the other method in certain cases when the other method is unable to effect a cure alone. In order to effect a cure, all cases must have dietetic care, and most of them require medical treatment also, after operation.

The medical profession is not fully agreed on all the causes that may produce or prevent the healing of chronic gastro-duodenal ulcers. Three factors accepted by practically all observers are infection, pylorospasm, and gastric hyperacidity.

These may be caused by conditions in the body some distance from the site of the ulcers.

In almost all peptic ulcers removed by operation a streptococcus infection can be demonstrated. It has not been proved whether this infection is brought by the blood stream from foci of infection in other parts of the body, or enters directly from the contents of the stomach. In infections of the mouth and throat virulent bacteria are being swallowed almost constantly. To prevent this the patient should have proper dental treatment and if indicated, the tonsils should be removed.

By pylorospasm is meant a spasmodic contraction of the muscles of the pylorus which guards the opening from the lower end of the stomach into the duodenum, which is the upper segment of the intestine. This interferes with, or in some instances, prevents the emptying of the stomach into the intestine. This causes violent contractions of the muscular coats of the stomach in its effort to empty itself and the contents are forced through the nar-

*Presented at the General Meeting of the Oklahoma State Medical Association at Oklahoma City, May 13, 1931.

rowed opening with considerable force striking the walls of the first part of the duodenum.

One of the causes of the increased secretion of hydrochloric acid by the stomach is the increased muscular activity caused by pylorospasm and the hyperacidity in turn aggravates the pylorospasm.

Most peptic ulcers are found in the first portion of the duodenum and on the lesser curvature of the stomach. In these locations the mucous membrane is more closely adherent to the muscular coats than in other parts of the alimentary tract so it is more liable to injury by the forcible muscular contractions, which also interferes with its blood supply more than other parts.

So it is readily understood how pylorospasm aids in the formation and prevents healing of ulcers in these locations. In addition to the local causes of pylorospasm and gastric hyperacidity, we must consider that they are often caused by diseases of the appendix, the gall bladder, the intestines, and in the female, of the pelvic organs.

In order that medical treatment have a fair show to cure peptic ulcer, all these conditions mentioned as the origin of infection or as to the cause of pylorospasm and hyperacidity should be eliminated and to do so will require surgery in at least a part of them. A very considerable percentage of medical failures are due to the persistence of one or more of these conditions.

Records of several of the larger clinics of this country show that approximately 70% of peptic ulcers are cured by medical treatment. With individual attention by the doctor and with full and intelligent cooperation on the part of the patient, this percentage would probably be somewhat larger. However this may be, in about 30% of all cases of peptic ulcer conditions develop that are indications for surgical treatment. These are (1) acute perforation, (2) unrelievable obstruction, (3) repeated massive hemorrhages, (4) reasonable suspicion of malignancy, (5) failure of medical treatment, (6) inability to take necessary medical treatment, (7) refusal to follow medical treatment.

In acute perforation, that is, where the ulcer perforates into the abdominal cavity with escape of contents of the stomach or duodenum, there is no question but that this is an indication for immediate surgery and the chances for the victim of this catastrophe surviving depends very largely on how soon operation is performed. Most cases operated within three or four hours after perforation will recover. After this his chances fade rapidly as time passes, and if not operated within the first twenty-four hours about the only chance is that the leakage has been so slow that it has been confined in a limited space by the formation of adhesions.

Obstructions in the stomach due to so-called hour glass contraction or at the pyloris occur rather frequently, but about half of them are caused by inflammation, edematous swelling, or muscular contractions and are relievable by rest and medical treatment. The others are due to contraction of scar tissue and require surgery for relief.

Massive hemorrhage from a peptic ulcer is a frequent complication. One or two hemorrhages are not indications for surgery where proper medical treatment can be carried out, but if as many as six or seven occur while under treatment it is generally agreed that it is time to resort to operation unless there are strong contraindications.

Reasonable suspicion of malignancy is a positive indication for surgery as soon as the patient's condition will permit. For the only hope of a cure, if malignant, lies in the early recognition and the removal of the growth before it has spread too far. Even where it has progressed to a stage where it cannot be removed it is often possible to prolong life and lessen suffering by appropriate surgical measures.

A certain percent of sufferers from peptic ulcers fail to obtain relief from medical treatment even though they cooperate fully. If their ulcers are not healed after a year they should be classed as medical failures and should be treated surgically.

Some patients are unable to take enough alkalies to neutralize the acid of the stomach over long enough periods of time to allow the ulcers to heal without developing the condition of alkalosis. This is especially found in sufferers from certain kidney diseases in whom not only alkalosis develops but the kidney condition is made worse. It is possible that some of these might obtain relief by methods of medical treatment other than the administration of alkalizing agents, but for most

of them their best chance of relief lies in surgery with proper diet afterward.

Others, due to their station in life, their occupation, or environment find it impossible to follow the long course of diet and drugs necessary to give a fair chance for a cure by medical treatment. These people should be treated surgically, followed by the best dietetic and medical treatment that is possible under the circumstances.

Then there is a large class of people having peptic ulcers who will not try medical treatment, or who will not follow it closely enough or for sufficient length of time to give reasonable hopes of lasting benefits. This may be due to weak will power, ignorance, or plain obstinancy. These as a class are not very desirable as surgical patients and many surgical failures occur among them. However, surgery is about the only chance they have for relief.

The surgical treatment of gastro-duodenal ulcers requires not only a high degree of skill in performing the operations, but also the very best of surgical judgment in determining what should be done in each case, and a thorough knowledge of the physiology of the organs involved, to the end that after operation they can carry on their functions in as nearly a normal way as is possible under the existing condtions. The concensus of opinion among surgeons at present is to do enough to cure the condition, at the same time avoiding the more extensive and complicated operations with their necessarily higher rate of mortality where simpler measures will suffice.

A great number of operations have been used in the treatment of peptic ulcers. We will consider some of these.

Closure of perforated ulcers. The most frequent site of perforation is the anterior wall of the first part of the duodenum. In this location it is only necessary to close with an infolding double line of suture. This may be reinforced by suturing a piece of omentum over the site of closure. In addition it may be advisable to do a gastro-enterostomy if the lumen of the intestine has been narrowed too much by the closure. In perforations of ulcers of the stomach, if the ulcer is large the entire ulcer should be excised; if small, the destruction of the base with a cautery may be all that is necessary. The opening is closed and a gastro-enterostomy performed.

Gastro-enterostomy, the making of an artificial opening from the stomach into the intestine, is the operation used more frequently than any other in the treatment of peptic ulcers. The opening in the stomach may be in the posterior or anterior wall, and anywhere along the length of the stomach. Unless for some special indication it is usually placed on the posterior wall a short distance below the midline of the stomach. The opening into the small intestine is usually in the upper portion of the jejunum, but sometimes the connection is made between the second part of the duodenum and the lower end of the stomach.

Plastic operations about the pylorus have for their object the relief of pylorospasm and enlargement of the opening. One method is to cut through the pyloric muscle without opening the mucous membrane, closing the opening in such a way as to prevent the severed ends of the muscle from uniting. Another is to extend an incision through the entire wall of the lower border of the pylorus extending on the one side into the stomach and on the other into the duodenum and uniting the cut edges so as to enlarge the opening.

Operations involving removal of tissues are listed as, exisions of ulcers, pylorectomy, partial gastrectomy, subtotal gastrectomy and total gastrectomy. We have already considered excision of ulcers. By pylorectomy is meant removal of the pyloris with a variable part of the first portion of the duodenum and a part or all of the pyloric antrum of the stomach. The term partial gastrectomy is used for operations on the lower part of the stomach where not more than half the stomach is removed. By subtotal gastrectomy is meant operations removing more than half but not the entire stomach. When the entire stomach is removed, or all except just enough to make a connection with the intestine, the operation is known as a tota! gastrectomy. This is used only in very rare occasions. In all of these resections the cut end of the duodenum is securely closed. The opening of the upper part of the stomach is either partly closed and an end to side connection made with the upper intestine, or it is entirely closed and a posterior gastroenterostomy done. As almost all gastric ulcers occur in the lower end of the stomach and this is the part secreting hydrochloric acid, the resection operations remove the ulcer bearing portion and also reduce the acidity.

In another operation on the stomach known as partial gastric occlusion, the stomach is cut entirely through above the ulcers. The upper part is treated the same as in the resections. The opening of the lower part is entirely closed. This operation is useful where due to adhesions or other complications it is impossible or impractical to remove gastric ulcers or bleeding ulcers of the duodenum. It is also useful to give temportary relief and prolong life in carcinoma of the pyloric end of the stomach that has progressed so far that complete removal is impossible.

Jejunostomy is an operation that is used very rarely. It consists of opening the abdomen and making an opening into the upper intestine through which nourishment can be introduced without passing through the stomach. By this means the stomach is put at rest and ulcers will sometimes heal or conditions improve so that other operative methods for their cure may be employed.

Now let us consider which of these operations are indicated in the conditions calling for surgical treatment.

In acute perforation of duodenal ulcers. When the base of a duodenal ulcer is destroyed by perforation there is a very strong tendency for the ulcer to heal. So simple closure is all that is necessary unless the closure reduces the lumen of the intestine enough to cause partial obstruction. In such cases it is necessary to do a gastro-enterostomy also.

Perforating ulcers of the stomach are treated by destruction of the ulcer, or by cutting them out, or by one of the resections, together with a gastro-enterostomy.

Right here we may state that in gastric ulcers treatment of the ulcer alone or gastro-enterostomy alone do not give good enough results to justify their use. In other words the ulcers should be destroyed or removed and a gastro-enterostomy should be done also.

In obstruction due to scar tissue contractions, gastro-enterostomy is the operation of choice and in almost every instance gives satisfactory results.

In repeated massive hemorrhages, the bleeding ulcer should be removed completely if possible and a gastro-enterostomy done. If impossible to remove the ulcer, if in the duodenum, a pylorectomy is the operation of choice. If of the stomach, partial gastric occlusion should be done. Operation should not be done during or immediately following massive hemorrhage. If it is severe enough to endanger life the patient is not in a condition to survive an operation. Usually at least ten days should be spent in preparing the patient after a severe hemorrhage. This should consist of rest and diet, and blood transfusion if needed.

If there is a reasonable suspicion of malignancy, one of the resection operations, extending well beyond the limits of the lesion in all directions should be done if possible. If not possible at this time, a partial gastric occlusion or a simple gastro-enterostomy, depending on the location, should be done with the intention of resection at a later operation if it becomes possible.

Ulcers classified as medical failures, also those in patients unable or unwilling to follow medical treatment should be treated as the classes already considered and the operation of choice will be determined by their location, size, and the symptoms they present.

Now for some of the causes for failure to cure by surgery. The gastro-enterostomy opening may be too large and too near to the esophageal end of the stomach so the food passes into the intestine without the necessary digestive action by the stomach. If this cannot be controlled by diet, that is by giving partially digested food or food that does not require the digestive action of the stomach, it may be necessary to re-operate, closing this opening and making another smaller opening in a better location. If the opening is too small and poorly placed the stomach is forced to violent contractions and we have the same condition that results from pylorospasm or organic obstruction. If this cannot be remedied by diet and medical treatment it is advisable to re-operate, making a larger and better placed opening. Probably the most frequent post-operative complication is the formation of a marginal ulcer. That is an ulcer forms in the jejunum at the margin of the gastro-enterostomy opening. If this does not respond to medical treatment and diet, and unfortunately it rarely does, it is necessary to re-operate. If the original ulcer has healed the marginal ulcer may be excised and the gastro-enterostomy closed. If the original ulcer has not healed, it will be necessary to resect part or all of the lower half of the stomach which secretes hydrochloric acid. We have already mentioned failure due to insufficient operative meas-

ures such as failure to close the pyloric opening where it is indicated, and failure to do both a gastro-enterostomy and to destroy or remove gastric ulcers.

The condition known as a vicious circle sometimes develops after a gastro-enterostomy. It is caused by an obstruction in the intestine below the opening. The stomach contents cannot pass this obstruction, so they pass through the pylorus and enter the stomach again through the gastro-enterostomy opening to be vomited. This condition requires a second operation to relieve the obstruction.

Each case should be carefully studied and after getting the patient in the best possible condition for an operation, then the operation best suited should be properly done. Then the patient should have proper post-operative care, including dietetic and, if indicated, medical treatment. Then too, the surgeon must not overlook the treatment of contributing causes in other parts of the body as was mentioned in preparing the patient for medical treatment.

Surgical treatment of gastro-duodenal ulcer as now carried out is successful in a very great majority of cases, but is not satisfactory in all, and great efforts are being made for improvement. We have every reason to expect better results in the future than has been obtained in the past.

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FRACTURES OF THE SKULL CLINIC MAY 12 AND 13, 1931

HORACE REED, M.D.
OKLAHOMA CITY

In fractures of the skull we are not concerned with non-union nor are we concerned with the treatment of the fracture *per se*; unless the fracture is in some portion of the skull as for instance, in the frontal region where the cosmetic affect would be bad. But we are very much concerned in fractures of the skull with the condition of the structures which the skull is supposed to protect: *namely* the brain and its appendages. As a matter of fact, injuries of the skull bone do not repair themselves as do injuries of the long bones. The orthopedists lay great stress on the reparative function of the periosteum of the long bone. The covering of the cranial bone is not periosteum in the same sense. It does not possess that quality which the covering of the long bones have in restoring injury. Hence, if a considerable segment of a cranial bone is lost, even though the pericranium is left intact, there will not be new bone formation.

The history of fracture of the skull is interesting. This was particularly true a century ago when fracture of the skull was looked on as having great surgical import. I was recently presented with a copy of one volume of "Pott's Surgery" by a friend, in which I read that some surgeons believed that every fractured skull should be trephined. Pott was more conservative. He said that certain cases would recover without having anything done, and in his opinion about seven out of ten would require this operation. In that day surgeons resorted to heroic measures to diagnose fractures of the skull. They would remove large flaps of the scalp looking for a fissure. Pott observed that these flaps would often become necrotic from infection; therefore, he was recommending a procedure which became the vogue somewhat later. This procedure was to make criss-cross incisions forward and backward and from side to side so as to expose the skull through long grooves in the scalp in search of fissures in the bone. If fissures were not immediately in evidence resort was sometimes made to the use of dyes rubbed on the bone in an endeavor to locate a fissure.

We recognize the fact that we do have skull fractures without injury to the brain. Even though this condition is rare, we do see patients recover without any sequelae whatsoever. Be this as it may, it behooves us to formulate a method of diagnosing fractured skull as an entity. This is a day of compensation for injuries and if a person has had an injury to his head he often has trouble following the injury—real or imaginary. We have not yet found out how to differentiate between the real and the imaginary in all cases and we probably never will be able to be correct in every case.

Let us consider the direct signs or symptoms of fracture of the skull. *Pain* is always present. Not all persons who have a pain in the head after an injury have a fractured skull. If one receives a blow of sufficient force to cause a hemorrhage, a swelling, or a contusion, the point where this takes place will be painful to the patient. It would be significant of fracture if after an injury to the head, the surgeon can locate a painful line. Such a line can be delineated by palpating over the head, finding two painful points and determin-

ing whether or not there is a line connecting these points along which there is pain on pressure. Such a painful line would correspond to a fissure in the bone. The determining of the location of a fissure would be significant if there were signs of brain injury in that same region.

Displacement of fractured fragments is another sign. If a person receives a blow from a hammer or falls against the curb of a street, a fragment of bone may be driven inward. We will find a defect, a depression corresponding to the fractured area. Such a fracture is always comminuted. If the fragment which has been driven inward, at the same time is broken into small pieces, the intracranial pressure may force the fragments out again against the scalp. In such cases there would not be the depression but there would be *unnatural mobility* detectable by the examining finger. The fragment however, which has not been broken into small pieces will be held firmly against the inner surface of the skull leaving a depression on the surface equal at least to the thickness of the bone. There is one possible cause for confusion in diagnosing a depressed fracture: *Namely*, a hematoma. If there is considerable bleeding under the pericranium this structure separates from the skull easily except at the suture lines where it is held tightly. When one palpates over the hematoma there is a sensation of a deep depression underneath. Continuing the palpating over the suture area one feels what appears to be a partial elevation of bone. this is due to the swelling or infiltration which takes place in the more external layers of scalp just beyond the suture line. If the surgeon will press firmly and continuously over this ridge for a minute or two, he will find his finger making a groove in the swollen tissue and eventually he will be able to demonstrate that the contour of the bone is smooth and continuous on both sides of the suture line where at first it felt like a displacement.

Irregularities of the skull must be mentioned. Many persons have irregularities of the skull which are normal. Others may have irregularities due to old injuries. It is important to bear these facts in mind, particularly when diagosing depressed fracture in persons who are unconscious.

A fourth, and most important sign, of fracture of the skull is *hemorrhage*. We need not consider, from diagnostic viewpoint, a compound fracture of the skull with blood and brain substance exuding because this condition presents no diagnostic difficulty. Nor need we consider, seriously, bleeding from the nose or mouth following a head injury, if the injury also involved the region of the face. Bleeding from the ear may be caused by an injury to the external auditory canal and a ruptured drum is not always evidence of fractured base in head injury. If there is blood in the external auditory canal one should determine whether or not it is due to actual injury in that region or the spilling of blood into the ear from some other part of the head. Bleeding from the nose or mouth is significant:

(a) If there has been an injury to the structures of the nose or mouth and

(b) If it persists for hours, the blood gradually becoming lighter in color and finally serous in character.

The same is true of the ear. Bleeding from a fractured base which communicates with the external auditory canal will persist for hours but the flow is an admixture of blood and cerebral fluid. It finally becomes clear and free from blood. A black eye is significant of fracture of the orbital region if the "shiner" shows up only after some hours following injury. Discoloration behind the ear in the mastoid region, which makes its appearance within a day or more following the injury of the head is also significant of fracture of the base.

While the foregoing signs and symptoms are very essential in the diagnosis of fracture of the skull *per se*; and are helpful, taken in the order given, they are not so significant as what we may call the indirect signs of fracture. The indirect signs are evidence of brain injury with which we are at all times concerned, and the injury of certain cranial nerves. The most commonly involved are the facial, the sixth, the optic, and sometimes the third.

In the evaluation of paralysis of a nerve following an injury, one must remember that the paralysis must have been simultaneous with the occurrence of the injury. The injury of course takes place where the nerve is in contact with the fractured bone. A paralysis which takes place gradually following an injury would be either injury in the cortex area of the brain from hemorrhage, or contusion, or from a secondary infection of the nerve itself.

How about the X-ray and what do we accomplish in diagnosing by its use? I have

made the statement that if we know where the fracture is we have information which may be of help in determining the location of a possible blood clot if such is in question. However, we may be deceived in this respect but this is a day when X-rays are considered as an essential method in diagnosis. Unfortunately there are two distinct handicaps in its use. First, it may not reveal a fissure fracture or if it does it does not necessarily prove where the injured portion of the brain is located. Secondly, the efforts made in getting the patient to the X-ray may in themselves work harm to the patient. My advice would be, always have an X-ray made in suspected fracture of the skull but to wait until such time when it will not work a further injury to the patient.

How are we going to determine clinically where the fracture is? Suppose we have a patient who has received a blow on the vertex of the skull. Will the fracture be where the blow has been received? What is a contrecoup fracture? Such a fracture has been described as taking place on the opposite side of the skull from which the blow was received, caused by a wave of force transmitted through the brain and received on the opposite side. From a practical viewpoint we need not concern ourselves with contrecoup fractures, but we know of a certainty that the brain is frequently injured on the opposite surface of the skull from which the blow was received. If a blow is received on the vertex there may be no fracture at that point but there may be fracture around the perphery of the skull. As the vertex of the skull is depressed toward the base the periphrey must expand. This expansion will cause fissures to take place in radial lines which may have their beginning even some distance from where the force was applied.

"WHEN, AS AND IF"

The bottle-fed baby exhibits symptoms indicating partial vitamin B deficiency—described by Hoobler as (1) anorexia, (2) loss of weight, (3) spasticity of arms and legs, (4) restlessness, fretfulness, (5) pallor, low hemoglobin, etc.

Dextri-Maltose with Vitamin B may be used in adequate amounts (up to 71 Chick-Roscoe units) without causing digestive disturbance. This ethically advertised product derives its vitamin B complex from an extract of wheat germ rich in B and brewers yeast rich in G. Physicians who have attempted to make vitamin B additions to the infant's formula but who have been obiiged to abandon same due to diarrheas or other unfortunate nutritional upsets, will welcome Mead's Dextri-Maltose with Vitamin B. This is a tested product with rich laboratory and clinical background and is made by Mead Johnson & Company, a house specializing in infant diet materials.

Not all infants require vitamin B supplements, but when the infant needs additional vitamin B, this product supplies it together with carbohydrate. In other cases, the carbohydrate of choice is Dextri-Maltose No. 1, 2 and 3.

NATURE AND TREATMENT OF TOXEMIA OF INTESTINAL OBSTRUCTION AND ILEUS

Charles S. McVicar and James F. Weir, Rochester, Minn. (Journal A. M. A., March 16, 1929), report on a study made on patients suffering from the effects of intestinal obstruction and ileus. Their observations include illustrative abstracts of the clinical manifestations, chemical changes in the blood, and reactions to treatment in a comprehensive series of cases. When it was discovered that striking changes in the chemical condition of the blood was associated with clinical evidence of severe toxemia in cases of obstruction of ileus, it seemed logical to assume that the toxemia was due to the changes in the blood and that if an adjustment in the disordered chemical balance could be accomplished there would be amelioration of symptoms. This hypothesis appeared to receive support from the fact that comparable changes in the chemical status of the blood were found in experimental animals that survived the initial shock of operations intended to produce obstruction. Treatment was therefore directed to raising the chlorides of the blood, lowering the alkalinity, and lessening the urea retention. As the result of much experimentation, an effective method of treatment was worked out. It consists in the intravenous administration of solutions containing 10 gm. of sodium chloride and 100 gm. of dextrose to each liter of water. Severe motor inhibition and marked chemical disturbance of the blood may occur following operations in which the gastro-intestinal musculature has not been traumatized. In acute intestinal obstruction, the signs and symptoms are as a rule sufficiently clear to permit diagnosis and to demand surgical intervention before disturbances occur in the blood. The theory of physiologic dehydration mentioned by earlier writers seems to find support in the authors' experience.

DEMENTIA PRAECOX

R. G. Hoskins, Worcester, Mass. (Journal A. M. A., April 11, 1931), believes that the current formulations of the nature of dementia praecox are too complex to afford a suitably comprehensible basis for therapy. A simplified formulation is offered that emphasizes the practical aspects of treatment. The psychosis is regarded as a persistent dream state. It is a protective reaction in a sensitive subject to a sense of personal failure to meet his own standards. The consequent loss of self-respect renders existence in the world of reality intolerable. Therapeutic efforts should be directed to restoring his self-respect, thus eliminating the necessity for the protective reaction. This can best be achieved by correction of faulty standards, by augmenting the patient's store of avilable energy, by teaching him an improved technic for utilizing existing energy, and by various types of situational therapy. The formulation is susceptible of intelligible, detailed presentation to those not conversant with technical psychiatry.

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DR. CLAUDE A. THOMPSON.....Editor-in-Chief
Memorial Station, Muskogee, Okla.

DR. P. P. NESBITT.....Associate Editor
Medical Arts Building, Tulsa, Okla.

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EDITORIAL

THE AMERICAN MEDICAL ASSOCIATION

At the Philadelphia meeting officers for 1931-32 were elected as follows: President-Elect, Dr. E. H. Carey, Dallas, Texas; Vice President, Dr. George C. Yeager, Philadelphia; Secretary, Dr. Olin West, Chicago; Treasurer, Dr. Austin A. Hayden, Chicago; Speaker, House of Delegates, Dr. Fred C. Warnshuis, Grand Rapids; Vice Speaker, House of Delegates, Dr. Albert E. Bulson, Fort Wayne; Trustees, Doctors Thomas S. Cullen, Baltimore; Walter S. Donaldson, Pittsburgh; Dean Lewis, Baltimore; and a member of the Council on Scientific Assembly, Dr. John E. Lain, New Haven.

The election of Dr. E. H. Carey, the highest compliment which may be paid an American physician, is also a timely recognition of the Southwest and one of its leading medical authorities. Dr. Carey has long been connected with Baylor University, has been for many years a successful specialist, as well as a successful man. He not only stands high in the medical profession but is one of the leaders in civic endeavors in the State of Texas and the City of Dallas.

As usual the best thing about the entire meeting was the scientific exhibits. Probably no meeting has ever presented a more complete and interesting scientific exhibit. While the transactions of the Sections may be visualized and appreciated by reading articles presented at the meeting, the scientific exhibits must be seen to be appreciated. From the standpoint of attendance it seems to us the meeting should have had more members present; slightly more than seven thousand physicians registered.

SUMMER PERILS

Formerly Oklahoma annually expected a rather high percentage of malaria, typhoid and dysenteric infections, incident to either too much water and a consequent increase in mosquitos or too low a water level with a consequent high concentration of infections producing typhoid and dysentery. Thousands of people have learned the value of pure water and perhaps the majority of them go camping with the safe water supply in mind. Thousands of them have also taken advantage of the protective preventive aid of anti-typhoid vaccine. However, many thousands have not, and it may be expected that we shall have a rise in some of these infections during the next three months. Campers should protect themselves from mosquitos, from impure water, and from the insect pests common to our climate.

Many of the so-called tourist camps have the vilest surroundings and are a menace to those who patronize them. Often they are in the hands of very ignorant people who care for nothing except acquiring the fleeting dollar. Their water supply is impure, the ordinary sanitary appliances are simply nil, and perhaps of

all dangers, these are at this time the more prevalent.

The most the physician can do is to warn his clientele of the possible dangers.

—o—

THE PHILADELPHIA MEETING OF THE A. M. A.—REPORT OF OKLAHOMA DELEGATION

This is a preliminary report of our stewardship. It is our desire to go before the annual session of the House of Delegates of the State Association, and discuss in detail some matters which are of vital interst to the Oklahoma profession. In the meantime the Fellows of the American Medical Association, and those who receive the Journal of the American Medical Association, will have access to the transactions of the National House which will shortly be published in the American Medical Association Journal. On January 1, 1931, there were 752 Fellows in Oklahoma, and 246 others who were subscribers of the Journal. When our membership roster for 1931, was reported to the Secretary of the American Medical Association, we had 1634 members in the State Association. Of these only 822 were Fellows of the American Medical Association. In other words, in our State Association there were 50% plus 5, who were sufficiently interested in the National Association to become directly affiliated with it and subscribe for the Journal. We, as Delegates, were chagrined and embarrassed with these figures. We were not consoled by the fact that a few other states show up worse than ours. Some states show more than 70% of their membership as Fellows, and the average in the constituent societies, taken as a whole, is more than 62%.

The resolution which was unanimously passed by the House of Delegates of the State Association in May, 1931, was duly presented by the Oklahoma Delegates. To this was added, by resolution, a request that the Secretary of the American Medical Association be instructed to send a questionnaire to the non-affiliated members in the State. The discussion which took place in Committee to which the resolution was referred, brought out certain facts of much interest. We were informed that, already this year, each of our non-affiliated members had been circularized, and replies from many had been received. Some of these replies, we were informed, were in the form of criticism. As a result of the resolution we were promised that Oklahoma, at least, will again be circularized in the near future. Your delegates sincerely hope that all our members receiving the circuler will respond to it. We are assured that sincere and constructive criticism and suggestions are always welcomed. That which your delegates hope for most as a result of this activity, is a substantial increase in the membership of Fellows from Oklahoma.

The Woman's Auxiliary, a rapidly growing and useful organization, is also concerned. In a report, or letter to the House of Delegates, the Auxiliary expressed a regret that so many of the husbands of their members were not Fellows of the American Medical Association, and hence many of their members did not receive the American Medical Association Bulletin in which the activities of the Auxiliary are recorded.

The work of the House, for the most part was routine, and hence might be called tame. There were no exciting or tense moments, no outstanding speeches or flights of oratory. Even the election did not excite any contest of worthwhile note. Dr. Carey, of Dallas, was elected President by vote of the whole House, cast by the Secretary, as there was no other nomination. New Orleans as the meeting place for 1932, was selected on the first ballot over Memphis and San Francisco.

The House opposes the government giving free hospitalization and treatment for non-service connected sickness and disability in veterans who are financially able to pay. The resolution by which it expressed itself, also included a suggested form of insurance for sickness and disability.

The Bureau of Medical Economics which was created at the Detroit session, had some important matters referred to it by the House for consideration and report. The next annual session will probably be the time when the usefulness of the Bureau will be tested. Medical Economics has, up to the present, received scant attention by organized medicine, but the time has come when, apparently, economics as applied to the interests of the profession can no longer be evaded in the discussion of our organized bodies.

To some of us the most outstanding development in recent years in the annual meeting, is the Scientific exhibit. This exhibit alone is worth a good post-graduate course to any doctor who is interested in

the advancement of the art and science of medicine, if he will go through the exhibit and seek out those things he is interested in. The exhibits are well organized and classified, and at each and every booth was some one to explain the particular things of interest. We were pleased to find two places where Oklahoma physicians were exhibiting new developments of more than usual interest. The exhibition hall (Scientific Exhibits) is not open to the public. Only physicians, or those presenting proper credentials, were admitted, and yet at all times even right to the zero hour of noon, Friday, the immense hall, housing these exhibits, was a veritable beehive of activity and interest. If the standard of exellence of the Philadelphia presentation of this exhibit is to be maintained, the members of the Oklahoma Delegation can think of nothing which in our opinion would serve as a more convincing proof that the American Medical Association is fulfilling its function in an endeavor to elevate the professional and scientific standards of its membership.

The Philadelphia County Medical Society as host did a perfect job. Doctors are not always satisfied with the kind of entertainment offered at the annual conventions—some of them are not exactly modest in expressing themselves when they are not pleased. These remarks are intended as a preface to the statement that when satisfied they say little. If the entertainment was not satisfactory, we heard nothing to indicate the contrary. Philadelphia was the birthplace of the American Medical Association. New York claims to be the place of its conception. It is rather strange that even though Philadelphia was the birthplace of the Association as well as, also, of American Medicine, our Association did not go back home for a reunion for a period of more than 30 years. Most of us can remember when, not so long ago, a painted and perfumed blond, down on the sea shore, enticed us away from Philadelphia. Have we realized once again that, after all, mother is our best friend?

As an anticlimax to this statement may we say that the individual delegates from Oklahoma have now served for some years. Any ideas or benefits coming from this experience which may be considered as worthwhile belong, not to us alone, but to the profession of Oklahoma who sent us. Nominally our duties have been fulfilled when we have attended and taken part in the annual conventions. Actually we do not feel that we should stop at the moment of adjournment. If we can be of service to County Societies, preferably by cooperating with the various councilors in their periodic visits to the County Societies, we, individually and collectively, will be honored if permitted to help spread the gospel of the benefits of Medical organization. We hope that our attitude in making this suggestion will be received in the spirit in which it is made.

Respectfully submitted,

W. ALBERT COOK.
MCLAIN ROGERS
HORACE REED

Editorial Notes—Personal and General

DR. LEALON LAMB, Clinton, who has been ill at his home for the past two months is reported much improved.

DR. AND MRS. A. L. MOBLEY, and daughter, Muskogee, have gone to Denver, Colorado, to make their future home.

SOUTHERN OKLAHOMA MEDICAL ASSOCIATION held its quarterly session at Chickasha, Oklahoma, June 9, 1931.

DR. DANIEL W. WHITE, Oklahoma City, left the United States about June 1st for a visit to European clinics. During his absence he visited Dublin, London, Amsterdam, Budapest, Vienna, Paris, Rome and Brussels.

KAY COUNTY MEDICAL SOCIETY met at Tonkawa for their April meeting. Dr. C. B. Barker, Guthrie, gave a lecture on "The Suppurating Ear and Its Complications," illustrated by slides and moving pictures.

JEFFERSON COUNTY MEDICAL SOCIETY met in regular session in Ryan, June 1st. After a dinner was served papers were read on the subject of "Cancer," by Doctors Wade, Watson and Derr. A general discussion followed.

MUSKOGEE COUNTY MEDICAL SOCIETY met May 25th for their last meeting until Fall. Dr. C. V. Rice presented the following subject "Coeliac Disease, Nutritional Disturbances and Treated from a Vitamin Deficiency View-Point."

GARVIN COUNTY MEDICAL SOCIETY met June 17th, at Lindsay. Following the banquet Dr. W. M. Taylor, Oklahoma City, read a very interesting paper on "Diarrheas of Infancy," and Dr. W. H. Livermore, Chickasha, gave a talk on "Spinal Anesthesia."

POTTAWATOMIE COUNTY MEDICAL SOCIETY met April 18th with a banquet at the Aldridge Hotel, Shawnee. Dr. J. A. Walker, Shawnee, made a talk on the "Anatomy and Histology of the Liver," which was followed by a talk by Dr. Lea A. Riely on "Diabetes Mellitus."

MUSKOGEE COUNTY MEDICAL SOCIETY met April 27, 1931, and had the following program: "Fractures of the Forearm," Dr. John E. McDonald, Tulsa; "Serum Treatment of Malta Fever With Report of Four Cases," Dr. B. E. Bradley, Tulsa; "Virus Infection of the Central Nervous System," Dr. Ned R. Smith, Tulsa.

OKMULGEE-OKFUSKEE COUNTY MEDICAL SOCIETY met June 8th, at the Beauclair Hotel, Okmulgee, for their regular meeting. The program was as follows: "Certified Milk and Its Handling," by Dr. C. Pedrick, Tulsa. Dr. M. J. Searle, Tulsa, gave a talk on "Summer Diarrheas." A buffet lunch was served after the meeting.

LINCOLN COUNTY MEDICAL SOCIETY met at Chandler, June 1st, 1931. Dr. J. M. Byrum read a paper on the "Ruptured Appendix," and Dr. G. N. Bilby, State Health Commissioner, made a talk on the activities of the State Health Department. Dr. Bilby told what the Department was doing and explained why the Venereal Clinic at Oklahoma City was discontinued, after which the Society, by a unanimous vote, endorsed and commended him in the work he was doing.

THE SOUTHEASTERN OKLAHOMA MEDICAL ASSOCIATION met in McAlester, Wednesday, June 24, in the auditorium of the Aldridge Hotel. The annual election of officers was held at this meeting and the following program rendered, with medical and surgical clinics at hospitals: "Ether Anaesthesia," Dr. J. T. Wharton, Durant; "Opportunity, Privilege, and Duty," Dr. W. A. Ramsay, Quinton; "The Relation of Neurology and Endocrinology," Dr. Henry H. Turner, Oklahoma City; "Some Phases of Anemia," Dr. Wann Langston, Oklahoma City; "Some Phases of Hyperthyroidism," Dr. J. F. Parks, McAlester.

THE SOUTHERN OKLAHOMA MEDICAL ASSOCIATION held its 11th quarterly session at Chickasha, June 9th, with the following program:

Address of Welcome—Dr. M. A. Nash, President of Oklahoma College for Women.

The Bacteriological Aspect and Treatment of Chronic Arthritis, (with Moving Pictures)—Drs. Earl McBride and E. Goldfain, Oklahoma City. Discussion opened by Dr. Anderson, Durant; Dr. A. B. Leeds, Chickasha, and Dr. B. H. Cooley, Norman.

Warts, Big Ones that Flap and Little Ones that Kill (Lantern Slides)—Dr. A. E. Hertzler, Halstead, Kans. Discussion opened by Dr. J. B. Hix, Altus, Dr. C. P. Bondurant, Oklahoma City, and Dr. H. C. Antle, Chickasha.

Diseases of the Upper Urinary Tract with Special Reference to Diagnosis—Dr. J. Z. Mraz, Oklahoma City. Discussion opened by Dr. A. R. Sugg, Ada; Dr. R. C. Sullivan, Ardmore, and Dr. L. E. Woods, Chickasha.

Buerger's Disease—Dr. Pat Fite, Muskogee. Discussion opened by Dr. J. L. Patterson, Duncan; Dr. J. I. Hollingsworth, Stilwell; Dr. E. B. Dunlap, Lawton, and Dr. Gene Rice, Shawnee.

The Borderline Pelvis and the Uses and Abuses of the Obstetrical Forceps, (with Moving Pictures)—Dr. E. P. Allen, Oklahoma City. Discussion opened by Dr. J. M. Byrum, Shawnee; Dr. A. W. Nunnery, Chickasha; Dr. P. H. Anderson, Anadarko, and Dr. J. A. Rutledge, Ada.

Medical Economics—Dr. A. J. Weedn, Duncan. Discussion opened by Dr. C. W. Sprouse, Sulphur; Dr. N. P. Lindsey, Pauls Valley, and Dr. C. C. Allen, Frederick.

JAMES WOODVILLE MARSHALL

James Woodville Marshall was born on May the 8th, 1866, in Hawkins County, Tennessee. His parents moved from Tennessee to Bosque County, Texas in 1880. He moved next to Madison County, Arkansas, in 1885.

He married Miss Maggie Carr in 1891, and to this union there were born seven children, six boys and one girl. The girl died when only three years of age. There remain of his own family six sons and his wife. Of his father's family there now remain one brother and one sister. He has many relatives and hosts of friends. Surely his going has brought to us, as well as these, sorrow. They and we mourn but with a joy of remembrance that is kind.

He entered the practice of medicine about 36 years ago. In October, 1898, he moved to the present residence where his wife resides.

He was born the second time into Christianity in 1902. At that time he joined the Rock Creek Baptist Church. Some three years ago he moved his membership to the Liberty Baptist Church, 109 Rich Street, Shawnee, Oklahoma. His life as a Christian has been consistent ever since he became a member of the church.

James Marshall was a man among men. He had few enemies, and they were of the kind that were enemies of righteousness, because he clung tenaciously to right and righteousness, and what enemies he had were those who refused to follow his righteous leadership.

He had many friends, and once he made a friend, that friend was his friend always. He always dealt justice and fairness to all, always plainly and without pretense speaking the truth and right as he knew it. His patients always loved him and confided in him as a father. He knew and loved the suffering. When he gave, he gave his best to alleviate pain and suffering.

It can be said of him that "He went about doing good." His friends knew and loved him, and his enemies respected him. He grew into the life of his friends and community until they say, "How shall we get along without him?"

He did that thing that few medical men do, contented himself with a rural practice from the country. He felt his place was with the men and women and children of the country, where in God's great out-of-doors he could have the contact of nature's great healing for body and soul as well, together with his medical skill. He labored, lived, loved and gave himself unstintingly to his friends, his patients, his community and his church. From his life we may gather,

now that he is gone from us, inspiration for the tasks that we meet day by day, and serve God and men more honestly, lovingly and with higher purpose.

We can be fully persuaded, that when God's great assize of men and nations comes, that the life, love, labor, and faith, and hope of James Woodville Marshall will not go unrewarded by Him who shall judge the quick and the dead and reveal the hidden secrets of men and the ages.

"Not now, but in the coming years,
It may be in a better land,
We'll know the meaning of our tears,
And then, perhaps we'll understand."

He is dead to us, but alive to the greatest life there can be. A quotation from Cyrus the Great is appropriate: "My Son, while I was with you in life, you knew my soul was there from what I did, and now, be persuaded, that when I am dead to you, that same soul will go on doing and you can then, as you are now, no more see it than now you do so. It will just merely lack the body for a time, and when you come, freed from the body, you will then perceive what I have done fully, both now and then."

—Contributed.

BENJAMIN F. APPLEWHITE

Whereas, It has pleased the Creator of all men to take from our midst Dr. Benjamin F. Applewhite of Tecumseh, Oklahoma; and

Whereas, He was a faithful member of the Pottawatomie County Medical Society while actively engaged in the practice of his profession, at all times typifying the highest professional ideals, and

Whereas, He faithfully served his profession as one of the Pioneer organizers of Medicine in this Country, not only being one of the first but serving two terms as President of this Society, and

Whereas, He was a loved husband, father and friend to all who knew him and called on him for help, always considerate of those about him, conservative in his opinions and statements, tolerant of the opinions of others, ready to give his best to those in need of assistance, medical or otherwise,

Be It Resolved, That we, the members of the Pottawatomie County Medical Society deplore his untimely death and as a token of our respect request that a copy of these resolutions be printed in The Journal of the Oklahoma State Medical Association and that a copy be forwarded to his bereaved family.

—Contributed.

DERMATOLOGY, X-RAY AND RADIUM THERAPY

Edited by C. P. Bondurant, M.D.
413 Medical Arts Building, Oklahoma City

Pustular Psoriasis. H. W. Barber, Proc. Roy Soc. Med. 23:1637 (Oct.) 1930.

H. W. Barber presented this case in support of the contention that the condition described by Sr. Dore in January, 1928, as a "chronic, mild, localized type of acrodermatitis perstans," of which Dr. Roxburgh showed two cases in October 1927, is really a pustular form of psoriasis. At the meeting of the next British Association of Dermatology and Syphilology, this question was to be discussed in detail.

This patient was shown with scaly patches on the palms, involving chiefly the thenar eminences. In these patches arose intra-epidermic pustules, which dried to form brownish scabs; the palmar surfaces of the fingers were also affected to some extent. Similar patches were present on the soles over the instep, particularly on the left foot. There were symmetrical scaly patches on the knees, which appeared to be ordinary psoriasis, and the nails, particularly those of the thumbs, presented changes-pitting and scaliness of the nail beds-suggestive of this disease and entirely different from those in true acrodermatitis. The results of examination of scrapings and cultures were negative, not only for fungus, but also for micro-organisms.

Treatment of Interdigital Mycoses Paste. R. Sabouraud, Ann. de dermat. et syph. 1:921 (Sept.) 1930.

It is Sabouraud's opinion that the failure to cure Interdigital Mycoses is due in great part to the thick corneous layer beneath which the parasites lie protected from the medicament. With this in mind, he has used pastes of barium sulphide to produce exfoliation, and has obtained excellent results.

The patient applies the depilatory mixed with a little glycerin (a watery paste is less satisfactory) for from twenty to thirty minutes after he has taken a prolonged warm foot bath. The paste is then removed with water; equal parts of tincture of iodine and alcohol are then applied. This procedure is repeated each evening, the paste every second day. No dermatitis venenata has been produced.

Is Syphilis Curable? E. Hoffman, Dermat, Ztschr. 59:279 (Oct.) 1930.

The author maintains that syphilis in the seropositive primary and reasonably early secondary stages is curable in a high percentage of cases as well as in the seronegative primary stage. He gives a list of ten criteria for a cure of syphilis and discusses their relative importance. The importance of early adequate therapy is stressed, and the maximal combined arsphenamine-bismuth cure is advocated. This consists of two or three courses of five or six weeks each with five or six weeks rest period between them. Treatments are given twice a week, the patient receiving from 0.45 to 0.6 Gm. of neoarsphenamine intravenously and from 1.25 to 1.5 cc. of bismuth subsalicylate intragluteally at each visit. The smaller dose is given to women. The use of arsphenamine alone

is condemned, and insufficiently vigorous early treatment is blamed for recurrences.

The Prognosis for a Serological Cure in Syphilis. Edward A. Morgan, Canad. M. A. J. 23:811 (Dec.) 1930.

Morgan concludes, after a study of 270 cases, that one's ability to obtain a negative Wassermann reaction of the blood in congenital syphilis depends primarily on the stage of disease in which treatment is commenced. In the early stage, 80 per cent can be cured; in the latent, 64 per cent, and in the late stage 49 per cent. It requires about eleven months of treatment for the early stage and twenty-eight months for the later stages. Morgan used as a routine measure arsphenamine intravenously once a week for six weeks, and mercury by inunction, by mouth, or by both methods for a second six weeks. If the Wassermann reaction of the blood is positive, the course of treatment is repeated again and again until a negative test is obtained. The results from treatment with bismuth in a small series of cases were not favorable.

A Peculiar Papular Eruption of the Hard Palate. H. Orr, Brit. J. Dermat. 42:436 (Oct.) 1930.

Orr describes a peculiar eruption of the hard palate which he has seen in seven men all over 40 years of age with one exception (aged 30). They were heavy smokers and two had old syphilitic infections. The lesions occupied the middle third of the hard palate and consisted of whitish papules varying in size from a pinhead to one-twelfth inch in diameter. In the center of each lesion is a minute red spot which, under a lens, appears to be the patulous orifice of the duct of a palatine gland. Two or even three of these red spots are seen in the larger lesions. The edges of these lesions are sharply defined and precipitous, the surface flat. The duration of the disease varies, having been as long as four years in one case. The only measures of cure resulting has been the cessation of smoking. Clinically and histologically, the lesions suggest flat warts. Beyond a feeling of roughness to the tongue, symptoms are usually absent, but in two cases slight soreness was complained of. In two cases in which smoking was stopped the lesions completely disappeared in four months; the remaining five cases have not improved.

A Case of Multiple Horny Cysts of the Sweat-Ducts. J. H. Twiston Davies, Brit. J. Dermat. 42:437 (Oct.) 1930.

Twiston gives us an example of a widow aged 70 in which a case of multiple horny cysts of the sweat ducts is described She suffered from itching of the upper part of the trunk and arms for at least five years; three months before she was seen numerous pimples appeared, and the itching became so severe that it interfered with her sleep. The eruption affected, in the order of intensity, the upper part of the back and chest, the neck, groin, axillary folds and upper extremities. It consisted of a diffuse pigmentation varying in depth, and though not sharply defined, was definitely absent from certain parts, viz, the anterior surface of the breasts and lower extremities. The palms were free from cysts, although the patient remembered having some there. Over the pigmented areas were scattered numerous conical papules averaging from 2 to 3 mm. in diameter, with none more than 4 mm. The contents of the papule, a single white seedlike body, shone through the thinned epidermis covering it. When it was pricked with a needle, a yellowish-white, smooth, spherical body could be expressed, having a slight depression at one pole; it was tough and elastic in consistency, and peeled like a minature onion. The syndrome consists of pigmentation, pruritus and multiple superficial horny cysts. The itching was greatly relieved by daily radiant heat baths followed by application of the high frequency current, although the appearance of the eruption was unaltered.

Reflections on Protein Therapy of Cancer. M. Rubens-Duval, Bull. et mem. Soc. med. de Paris, Nov. 14, 1930, p. 469.

According to the author, it is probable that cancer cures which are produced by local treatment (by surgery or radiation) are due not only to the destruction of the cancer cells but also to complementary reactions taking place in the organism. The cytlysis of young cancer cells is dargerous because it liberates substances capable of exciting cellular proliferation. But also other substances may be liberated which are immunizing the body against cancer cells. The purpose of the research work done by the author during several years was to isolate the latter in order to utilize them in cancer therapy. These substances are specific for each variety of cancer. They are administered in homeopathic doses and in extreme dilution, given daily and continuously.

SUMMER CAMP AS FACTOR IN CONTROL OF DIABETIC CHILDREN

Leonard F. C. Wendt and Franklin B. Peck, Detroit (Journal A. M. A., April 11, 1931), regard every large city as a potential field for the development of a camp for diabetic children, which exerts a powerful influence on the morale and physical fitness of this special group. After an experience of five summers in the management of a camp for diabetic children, which has grown from a makeshift affair with four patients to the rather complicated organization of 1930, which was capable of caring for fifty children, they feel that this type of organization fulfills a definite need and that the development of other camps for diabetic children is to be encouraged. The aim of all camps has been to get the child out doors for a time and away from the parents, who may also need a respite from the constant watchfulness so necessary in the treatment of these diabetic children. The child is likewise entitled to a vacation such as is given others more fortunate. There is, however, another important factor involved, which outweighs all other considerations; namely, the psychology of the diabetic child himself. Overemphasis on a chronic disability during the formative period has in many instances led to the development of definite abnormalities of personality in these children. Any one who has dealt with many of them realizes what a problem they often present. The child is not forced to give up his dependence and does not wish to do so. This dependence, coupled with a sense of physical inferiority, engenders an infantile type of personality. Some of these children are intelligent beyond their years, and most of them are emotional and subject to moods of depression and exhaltation. The group as a whole is difficult to handle except in a summer camp.

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J. SCHAEFER,
Bacteriologist.

HUGH JETER, M. D.,
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